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COMPUTER WEEKLY

NEWS IN BRIEF

AP option for 3031 in US

AN Attached Processor option for the IBM 3031 mainframe, claimed to boost throughput by 60 to 80% has been announced in the US. Similar to the AP option for the 370/158 and 168, the unit is a second processor which has no external channels or main memory but uses those of the primary CPU.

Deliveries begin in one year's time, and US prices are $375,000 or $12,500 a month to add the attached processor to an existing installation; and $1.4 million or $37,500 a month for a complete attached processor 3031 system with two Megabytes of main memory.

Megabyter launch

A BULK storage system based on 16K memory chips has been announced by Plessey. Called the Megabyter and designed for use as fast secondary storage for mini and microcomputers, the module comes in a standard 19" chassis capable of storing up to one Megabyte of data. Word length is 18 bits, data rate is 8 Megabits per second, and a 128K-byte system costs under £4,000.

Pensions takeover

TO expand its specialist bureau services, Unilever Computer Services has acquired Pensions Insurance Computer Services of Dean Street, London.

ITT buys Qume

DAISY-WHEEL printer specialist Qume Corp, of Hayward, California, is being taken over by ITT in an agreed share exchange deal which values Qume at about $148 million.

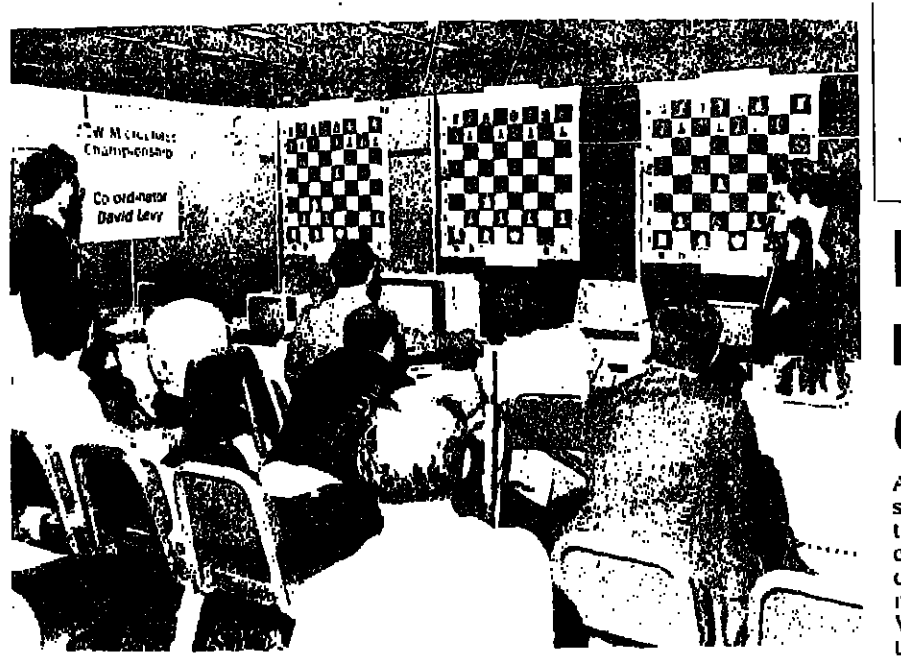
Runaway victory by DIY system

IN the first World Microchess Championship, a home-built computer ran out the winner, writes Donald Michie. The tournament was one of the features of last week's Personal Computer World Show, and was directed by International Master David Levy. The show sponsor, Personal Computer World magazine, offered a prize of £200 and this was won by Mike, a 6K program capable of 300 lookahead positions per second, developed by Mike Johnson and run on a home-built Motorola 6800 system.

Mike beat Boris in a play-off after both had scored 3½ points in the all-against-all contest involving six competitors. Boris, entered by the Shafit Corp, is a 3K program running on a Fairchild F8. It is capable of 30 lookaheads per second.

Play in the tournament can best be described as diabolically bad but promising. At any one time three matches were in progress, and with a time control of 30 moves per hour blunders and counter-blunders flowed briskly, enlivened by Levy's caustic and hilarious commentary.

The other entries and their scores were: Chess Challenger 10 (3 pts) which uses a Zilog Z80A; Microchess 2.0 (2½ pts) based on a Commodore Pet; and Fafner (2 pts) and Cocmn (½), both based on an Apple-2 6502.



David Levy (right) comments on play during the World Microchess Championship.

Dataskil makes a move in personal computing

A SOFTWARE package developed by ICL Dataskil to turn the Nascom 1 into a text processor, and a teletext/viewdata decoder from Technalogics of Liverpool, were among the new products on show at the Personal Computer World show in London last week.

But much of the hardware at the exhibition consisted of enhancements of existing product lines rather than product innovations, indicating that the personal computing market is showing signs of maturity, even though the crowded atmosphere at the West Centre Hotel carried the tang of freshness and excitement which is typical of this market.

On the Nascom Microcomputers stand, about a third of the space was given over to staff from ICL Dataskil, who were demonstrating a new screen handler and letter editor software package.

Running on a standard Nascom 1 board, with 1K byte of usable memory, the system on display contained an editor that handled the majority of text processing functions.

Something that offers different possibilities for the future is the Technalogics Expandable Computer, which combines a teletext/viewdata decoder system and will be introduced early next year.

Based on a Motorola 6800 processor, TECS uses a normal TV to give colour graphics and is currently a microcomputer that gives teletext decoding as a bonus. With the advent of viewdata, the capability will be added, greatly increasing its potential, as will the future addition of Basic programming. In its simplest form, it is expected to cost about £350.

The Sorcerer microcomputer from Exidy got its first UK showing on the stand of Computer Components of Barnet, Herts. Based on a Zilog Z80, it comes with 8K bytes of memory RAM, expandable up to 32K.

A slightly different feature of the system is a range of ROM PAC cartridges, which look like stereo cartridges, but in fact contain read-only memory devices for storing programming languages and operating systems.

Typical of the general developments in hardware on show was the 380Z system, seen on the Research Machines stand in a smart new black cabinet, and sporting three new configurations

The first, known as MDS-1, incorporates a single mini-floppy drive of 70k bytes capacity. This can be upgraded to the MDS-2 configuration that has dual drives. In a 32K byte read/write memory system, this configuration is priced at £2,176. The third is the FDS-2, which uses two drives running dual-sided discs offering a total storage capacity of 1 Mbyte. Next year, this will be upgradeable to a dual-density configuration. Currently, the FDS-2, with 48K bytes, is priced at £3,239.

IBM emulation on non-IBM systems

A FRONT-END processor providing non-IBM systems with IBM emulation capabilities is to be offered to mainframe manufacturers by National Semiconductor in the form of the IBM compatible System 400 announced earlier this year (CW, May 11).

The System 400, which is still being developed, will be built around high speed, bit slice microprocessor chips — National Semiconductor's own version of the Advanced Micro Devices 2901 chip set — and could be microcoded to convert IBM code to that of another machine.

The System 400 is expected to have a throughput capability approaching that of a 370/148 while being physically far more compact, and National believes that the machine is fast enough to act as an effective front-end IBM emulator for a big mainframe host.

Apart from offering the System 400 to mainframe manufacturers National also pl[…] the machine on an OEM […] big systems houses that […] implement systems us[…] IBM software expertise […] to very big IBM end us[…] the capability to devel[…] own software.

BCS bids to raise subs 30%

IN AN effort to meet rising costs, members of the British Computer Society are being asked to approve subscription increases of about 30% at their annual meeting on October 13. Subscriptions have been the same for two-and-a-half years, and it is hoped that this increase will last for another three years.

The Society's annual report, just published, shows only a small increase in the number of members over last year, and an actual fall in membership income, owing to an over-estimated provision for members who fail to pay. The society's income from Haymarket Publishing has also been much reduced, under a new contract whereby Haymarket contributed £100,000 to the cost of the new headquarters in Mansfield Street.

In his review of the year, outgoing president Professor Paul Samet expressed regret that so few members came to Datafair 77. The conference was a "flop", with only 328 attending, in contrast to earlier events that drew 1,000 or more. He said that more indication from members as to what they wanted was needed.

ICL chief names […] deputies

A 20 PENCE surge in […] share price against the […] the market greeted the […] cement last Friday of […] change in ICL's top m[…] ment structure since Dr […] Wilson became manag[…] tor last year.

In an effort to stre[…] strategic planning, Dr […] has appointed two dep[…] Peter Ellis, former […] worldwide marketing […] finance director Murray […] Ellis will be responsible […] duct and business plan[…] personnel and corpora[…] grammes, and Stuart […] ministration and corpora[…] formation systems […] existing responsibilit[…] finance.

The appointments en[…] Wilson to shed involve[…] the day-to-day running […] functions for the comp[…] to concentrate on wor[…] marketing, product de[…] ment and manufacturing

Leslie Cole, director […] industrial and commerc[…] sion for the past six y[…] ceeds Peter Ellis […] worldwide marketing

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Briefing

Calcomp to sell disc business

SEEKING capital to expand its plotter and interactive graphics terminal businesses, Calcomp has put its OEM hard and floppy disc drive manufacturing operation up for sale and is discussing terms with several companies. The division accounted for about one third of Calcomp's $120 million turnover last financial year. The company will continue to sell add-on memory to end-users.

In France, Thomson and the quasi-governmental IDI development agency are planning to invest in Calcomp equity and loans. Both are investors in SEMS, the company which makes the Solar 16 mini used in Calcomp's new graphics terminal.

ICL market team

TO co-ordinate and streamline its UK marketing operations, ICL has merged two divisions into the United Kingdom Division under Dr Peter Aylett. As director he will report directly to newly appointed director of Worldwide Marketing, Leslie Cole (CW, September 28).

Shares soar

FIRST dealings in Ferranti shares since they were suspended at 235 pence three years ago were predictably hectic. The shares opened last week, at 350 pence, soared to 400 and finally settled at 360 pence. Also attracting considerable interest in recent weeks have been the shares of Plessey, following renewed speculation of a Racal takeover.

Filling the gap

TO fill the gap between the HP250 and HP3000 Series II/III hardware, Hewlett Packard has introduced two new machines, the HP300 low cost general purpose computer, and a reduced power version of the 3000 known as the Series 33. Both capitalise on HP's expertise with silicon-on-sapphire integrated circuit technology. (See page 30).

Capital coverage

ON Thursday evenings and Friday mornings, starting this week, there will be a special Computer Weekly job advertisements on London's Capital Radio highlighting some of the many job opportunities carried in the paper each week.

Telenet talks

MERGER talks are under way between US packet-switched service pioneer Telenet Corp and an unnamed "major US corporation." Both GTE and Telenet decline either to confirm or deny US reports that GTE, the large US communications systems and equipment company, is the mystery bidder.

Compiler update

AN enhanced version of the Digital Equipment Coral 66 compiler has been introduced by DEC.

IBM's Orbit and DOCS—a challenge to IBM

MAJOR challenges to the IBM Series 1 minicomputer and the System 6 word processing products have been announced by IBM's own DP Division. A new distributive processing system, the long-awaited Orbit, has been launched as the 8100, while text processing software, terminals and printers have been added to the 3790 which transform it into the 3730 Distributed Office Communications System, DOCS.

Although based largely upon currently available hardware, the 3730 is the more significant announcement for the immediate future since it opens up the prospect of full-scale electronic mail facilities over SNA networks around 370 or 303X series host mainframes.

A new text processing terminal, the 3732, and document printer, the 3736, which uses the Qume daisy wheel print mechanism, are offered. Up to 16 can be attached to the 3790 in any combination and the system is available in a stand-alone version.

The 3732 display is based on the 3270 terminal series and will be built at Greenock in Scotland. The 3790 comes from Havant, Hants, and the printers will be packaged at IBM's Office Products plant at Austin, Texas. The software was developed at Hursley, Hants.

A 12-display version of the 3730 with four printers, and console line printer, costs £87,000 and deliveries are due to begin in February. A 370 host attachment will be added in January, 1980.

The main advantage of the 8100 over the 3790 is a new operating system, Distributed Processing Programming Executive, DPPX, supporting user programming in Cobol, Fortran or Sort Assembler. Transaction processing plus one batch stream is supported and there is a CICS-like database and transaction management system, DTMS. A second operating system, Distributed Processing Control Executive, DPCX, offers program compatibility with the 3790.

Two processors, the 8130 and the 8140, are offered with 256K and 512K bytes of main memory and 64 to 320 Mbytes of fixed disc storage.

System prices start at £41,215 for an 8130 with four terminals and delivery is due to start in a year.

● The 8100 incorporates 64K memory chips manufactured by IBM using a technology known as Silicon Aluminium MOS. This puts IBM in the forefront of memory development along with Texas Instruments and Fujitsu which have announced 64K chips.

RACING in to win the last event at the Computastars finals at Crystal Palace, London, on Saturday, Martin Rigby of Rowntree Mackintosh 1, clinches the team title of his team and wins the individual men's title for himself. Report and pictures — page 20.

4m jobless in UK—forecast for DoI

UNEMPLOYMENT in the UK of between 10% and 15%, or nearly 4 million, of the working population, is one of the predictions in an independent soon-to-be published report, Towards the Information Society, prepared under contract for the Department of Industry by the Science Policy Research Unit of Sussex University.

The report provides the DoI with a wide-ranging look at the implications of information technology and microelectronics, and potential results for the UK in their implementation. It is likely to be published in a few weeks.

The level of unemployment is seen in the report as coming predominantly from the administrative and clerical workers sections, where, it says, some 65% of the working population is employed, and where few steps have been made to improve productivity. In contrast, it sees an undramatic effect on employment levels in manufacturing industry, where productivity improvements are continually being made. Only those workers who employ simple skills learned by rote are seen as being affected.

There seems as much likelihood, according to the report, of unemployment coming from a general lack of uncompetitiveness in UK industry, which will affect all types of worker.

It sees world competition getting fiercer, so any disparity in the rate of adoption and adaptation to the use of microelectronics by different countries could be crucial. Here, according to the report, the UK does not rate very highly. The order seen for acceptance of microelectronics in new products is Japan, US, West Germany, Netherlands, Canada, Sweden, France, Italy, and then the UK.

All this, the report suggests, will lead to potential political instability, demands for job protection, political acceptance of this, and a consequent stagnation of the economy.

Despite this dark mood, there

⊕ Turn to page 25

ITT flirts with Exxon on WP

COMMUNICATIONS giant ITT has decided to move into the word processing business, and has had talks with a number of equipment suppliers with a view to marketing their systems in the UK and Europe.

One of the WP makers in question is Qyx, which is owned by Exxon, the US oil company, and is a pioneer of low-cost word processing (CW, Feb 23 and April 6).

Confirming this, an ITT spokesman said that no commitment had been made yet. "Our options are still open."

The Qyx machine as yet is available only in the North-eastern US, as the company's sales force is new and still quite small. Qyx has been looking for other organisations which might sell its equipment under licence.

ITT recently bought the printer manufacturer Qume (CW, Sept 28) in which Exxon had a minority holding and which, together with Diablo, makes the printers for nearly all word processors now sold.

ITT already has links with Exxon, in that it markets the Qwip facsimile machine in Europe, and even puts its own modifications into the equipment. Qwip, like Qyx, is a small, relatively new company set up by Exxon Enterprises as part of the oil firm's diversification plans.

64K chips on NCRs' Criterion 8600

A 10% power advantage over IBM's 3033 at the top end, 64K-bit memory chips from Fujitsu, and ECL-100K emitter-coupled logic circuit chips in the processor will be key features of the NCR Criterion 8600 line, due to be announced by NCR later this year (CW, December 8, 1977).

The 8600s will be offered with from one to four tightly-coupled CPUs, making use of the Criterion bus architecture which is similar to that widely used in advanced minicomputers but unique in a large mainframe.

The 8600s will run under an extended version of NCR's new VRX Virtual Resource Executive operating system.

NCR is the first major manufacturer outside Japan to announce firm plans to use 64K-bit memory chips. The 8600 will make the company a full-range competitor for IBM for the first time in its history.

COMPUTER WEEKLY'S INSIDE NEWS

A VIEW OF TOMORROW

Today, what is billed as the first magazine for the 21st Century, Omni, is launched in the UK, and in Futureview Ben Bova, science fiction editor of the magazine, talks to Robin Webster about some of the new developments with which society will have to contend (pages 10/11).

A major feature of that future will be the application of micros and their impact on almost every facet of the life of the community. One aspect of these applications is dealt with in this week's special section on micro-based games and calculators (pages 13/17).

These toys of tomorrow give slight, perhaps frivolous indication of the uses to which micros can be put. Much more serious effects have been forecast, such as the loss of jobs and the need for the redistribution of skills. These and related topics were the subject of a Univac seminar in Nice. Malcolm Peltu reports on page 3 and comments on page 2.

BETTER-THAN-BENCHMARK

Benchmark tests often give a flattering result, but according to tests reported by a New York consultancy, IBM's 303X systems can do a lot better than benchmarks. Page 8

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COMPUTERVIEW

Nothing new under the sun in Nice

A MESSAGE of hope was delivered from around a sun-drenched swimming pool near Nice last week. According to a group of journalists, academics, research workers and assorted pundits, the microprocessor does pose important problems on employment, but the problems are solvable.

This kind of superficial approach to a subject of great importance is typical not just of some of the opinionated and unsubstantiated views of many of the speakers at the Univac Seminar on computers and employment held near Nice last week, but of much of the current outpourings in the media on the subject of micros and employment.

Basically, the speakers in Nice consisted of optimists and pessimists. On the optimistic side were people like George Champine, director of Advanced Systems for Univac, and Russell Lewis, a Daily Mail leader writer. Both believed a free enterprise market economy would produce more jobs than they destroyed.

Ray Curnow head of the Science Policy Research Unit in Sussex University, and journalist Rex Malik led the pessimist school with plenty of talk of "step functions" and "quantum leaps" and the rate of technological change being greater than the ability of society to absorb it.

Both sides relied more on faith than facts.

Amidst all the waffle, two speakers got through to the nub of the whole issue, which is basically a political one.

Tory MP Michael Spicer said that the political parties will have to do some radical rethinking if information technology does have anything like the impact suggested.

And Terry Molloy, assistant general secretary of the National Union of Bank Employees brought the whole subject down to earth by pointing out that the seminar was not talking only about the future and was not involved in abstract contemplations.

NUBE members have already been involved in discussing with management the introduction of new technology, resisting in some cases, assisting in others. He said he hoped that unions would generally adopt an open-minded view and that they would be prepared to introduce new technology.

But he stressed that unless employers involved unions and their staffs early on, there could be great resistance to technological change.

Other countries, like the US, Japan and France, are rolling up their sleeves and getting down to doing something about it, investing in new industries, increasing public awareness, etc.

Surely it is now the time in the UK to cut the cackle and get on with tackling the problems and the opportunities.

BA aims to save £1m by ordering Amdahl mainframes

BY ordering four Amdahl 470 mainframes rather than four 3033s from IBM, British Airways believes that it will make a capital saving of £1 million.

The £7 million order, exclusively foreshadowed in Computer Weekly (September 14) is for two 4-Megabyte, 12-channel Amdahl 470V/7s to replace the two IBM 370/168s used on the BABS reservation system, and for two 4-Megabyte, 8-channel 470V/6s to replace two 360/65s at the West London computer centre.

The V/6s are due for installation at the end of the year, and will be used for the reservation services which British Airways provides to other airlines on a bureau basis, and for the Flight Information and Control of Operations, FICO, and Defect Information and Serviceability Control, DISC, applications.

The V/7s, currently the most powerful general-purpose mainframes available outside Japan, are due to go in next February and March. Once they are installed, at Boadicea House, Heathrow, the two 168s will take over the batch workload c rently running on three 360 at the same site.

The Amdahl machines ar air-cooled; the IBM 3 requires water cooling. The are also much more comp and the more powerful V/ smaller than the V/6.

It is difficult to get a pre power comparison between Amdahl and IBM machines Amdahl says that in ben marks, the V/6 is 1.5 to 1.7 as powerful as an IBM 370/1 while IBM sets the 3033 times a 168-3.

British airway

● Seen here following the contr signing — *and before flying back the US on Concorde* a [illegible] Amdahl (right) with [illegible] management services [illegible] British Airways.

FOCUS

Returning to the office

COMPUTING in the office has become a trendy theme lately, but it is hardly a new phenomenon. For many organisations, company computing started in the office.

It was only when the size and complexities determined a move that most DP sections obtained their independence. This breakaway, however, took long to achieve, the process having to work its way through sundry ranges of accounting machines, VRCs and small-scale tab machines.

It now seems that the industry is rapidly returning to the office. DP skills and talents are being dispersed together with the equipment to the outposts of company activities. A move from the relative seclusion of the DP installation to some remote location in Enfield or Godstone, is hardly one which appeals to many levels of DP management.

Neither is that of being moved closer to the seats of corporate power a pleasing thought. Given a choice of a seat, the DPM could prefer to be near his data base than that of the managing director.

Hardly surprising, then, that the frequent features on office computing are seized on by the DP team with almost as much relish as is accorded to the annual publication of the Computer Users' Year Book salary survey. This year's edition incidentally, reveals that over 40% of all DP managers are now provided with company cars.

The proposed distribution of DP resources could be the explanation. Mobility in the future will not necessarily be limited to tape and disc drives and the computer room trolley.

Recent front page news items in Computer Weekly have done their best to sow seeds of unease throughout the industry. "Three in battle for intelligent copier" (CW, August 24) was a typical example. Apparently those involved in developing a product which promises to form the basis of integrated office systems of the future, include Wang and Xerox. The future in this particular case doesn't seem so far away. Units are already in active service in Washington.

Two weeks later, a headline reported that "IBM and ICL are involved in an office challenge." While IBM has been busy developing electronic mail and word processing capabilities, ICL has been producing word processing software for the Singer terminal system. Both developments are seen as being part of the burgeoning automated office market place.

Despite the office alarm bells stridently ringing, it does seem that most of the established industry groups are content to let the office message pass by unheeded.

Just where the basic DP installation fits into all this office activity is not made clear. No one apparently has questioned the deliberate threat to the existing DP section. That future computer routines could well be entrusted to an advanced level typewriter does not seem to be worthy of comment.

However, should the expertise of the DP team be despatched into the general office, the first to suffer will be senior company management.

INTERRUPT

OPERATING the early commercial computers involved many hours of sitting and feeding tray after tray of punched cards into a card reader, removing them from the stacker and putting them back into the trays. There was little else to do unless the system stopped with an error condition.

One day an operator was getting towards the end of a typical run — 30 trays of cards through a "fast" 100 card per minute reader — when she came over to the supervisor with a puzzled look. She had noticed that more and more empty trays were accumulating but she could not understand why.

It did not take long for the supervisor to confirm that not all the cards being fed into the machine were coming out again, so she hastily called the customer engineer.

Standing at the end of the machine he released the catches on the machine cover, which promptly fell open, and a cascade of cards slid to the floor. The fault was simple: the guide in the card feed that directed the cards into the stacker had broken, allowing some cards to pass on through and drop into the back of the machine. The fault was soon fixed, which is more than can be said of the card decks which took many hours to sort out.

The moral is simple: What goes in must come out, but not necessarily the way you want.

● **Submitted by G. Nowell of Northampton who wins this week's £5 Interupt prize.**

Wilkes

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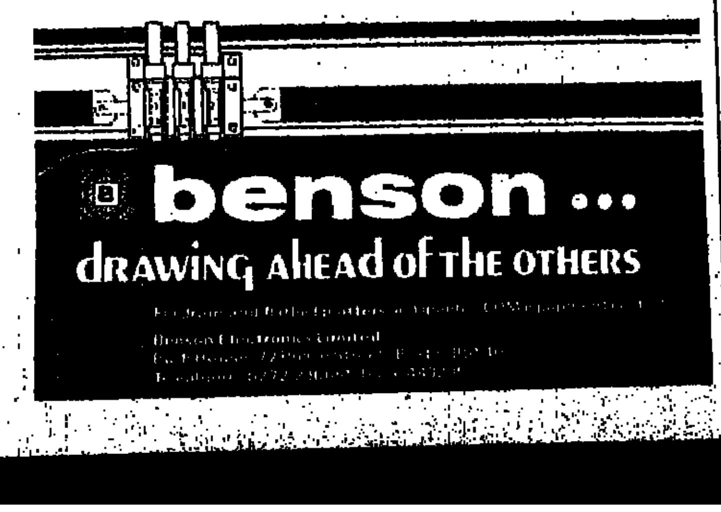
Ten years ago...

COMPUTER WEEKLY OCTOBER 3, 1968

ICL and RCA joined forces to make magnetic storage media. The creation of a jointly owned firm, RCA Magnetic Products, was seen as a move to make magnetic tapes the prime storage media in DP .... What was believed to be the first UK computer to be installed by a software house exclusively for program development came into operation at Hoskyns' Hatton Garden, London offices. The machine, a 16K ICL 1901, was being used by a team of 30 programmers .... A major share of the UK online process control market was the aim of a marketing campaign by IBM for its 1800 series machines .... A marked difference in the salaries paid to men and women doing comparable work in DP still prevailed, according to a survey by recruitment agents Reed Executive .... Highlight of Sicob was efforts by the French to improve the quality of their hardware .... Tape manufacturers 3M launched a cheaper brand of magnetic tape. Named Scotch 777 GP, it was being made at Gorseinon in South Wales.



benson ...
drawing ahead of the others

Benson Electronics Limited

MP sees micros as a political challenge

SPICER .... "difficult times for Tories."

IN the short term, computers are likely to have a serious effect on employment and could pose a major challenge to the philosophies of political parties, according to Tory MP Michael Spicer.

His own party, he said, could be facing "difficult times" in two areas: its attitude to the market place and to the work ethic.

Speaking at the Univac computers and employment conference in Nice, Spicer said that the free enterprise marketplace might not be able to cope with the demands placed on it by the rapid changes in information technology, which could have major and complex effects across a wide spectrum of activities.

For the Labour Party, he said, the greatest challenge would be the political forces that could lead them into defending "outmoded jobs" which would result in great inefficiencies and increased loss of national competitiveness, because the benefits of new technologies would be implemented more quickly by our economic rivals.

If information technology led towards a "leisure society" with an abolition of many manufacturing and office jobs, Spicer said the Tories would have to look again at their traditional views towards work.

For example, he said, it might be socially and economically necessary to have some people being happy permanently pursuing hobbies such as butterfly collecting rather than being an unproductive worker or one of the disenchanted unemployed. But, he said, it would be difficult for the free market to determine the "pay" of the butterfly collector.

He stressed, however, that the Conservative party had yet to decide on its attitude to government intervention in the supply and impact of information technology although, carefully avoiding the phrase "government planning" that is currently anathema to official Tory pronouncements, Spicer said he believed "the political process should anticipate the likely course and impact of the technology."

He also said he would do everything he personally could to try to steer any Tory plans for intervening in information technology away from the supply side and towards applications particularly micro applications.

The only Tory commitment so far on information technology has been the statement by Margaret Thatcher's key adviser Sir Keith Joseph, that the government had a role to play as a user of the technology. But Spicer said he felt this "good buyer" role might prove to be inadequate in the face of looming dramatic changes.

● See Computerview — page 2.

Two in three say computers will put people out of work

ALTHOUGH about two-thirds of people in the UK believe computers will put more people out of work than create new jobs, only 29% believe the introduction of computers should be discouraged.

That is the main conclusion of a survey conducted by National Opinion Polls for the Univac seminar on computers and employment, held in Nice.

Although NOP managing director John Barton admitted that the poll failed to analyse the motivation behind the answers, it provides the first real evidence in the UK of how the general public view computers and the possible impact of automation in increasing unemployment.

Based on interviews with over 1,000 people in paid employment, which Barton claimed was a nationally representative sample, the poll found great uncertainty in answer to the question of whether there should be more or fewer computers, with 23% don't knows and the remainder evenly split between those who want more and those who want fewer computers.

But there were more clear-cut views in answer to the questions of whether people believed computers would increase unemployment, and whether the use of computers should be encouraged.

Only 16% believed computers would in the long-run create more jobs than they destroyed. Of these, managerial and white collar workers were far more optimistic than other workers.

This class division was also reflected in the way almost 80% of management said they believed the use of computers should be encouraged, whereas only 42% of unskilled workers wanted to encourage computer use.

However, the overall picture is of most people accepting that computers should be encouraged despite their likely negative impact on employment opportunities.

In trying to determine people's attitudes to a "leisure society" in which increased automation will create a permanent high level of unemployment, the NOP found that 75% of their sample enjoyed work.

In the unskilled working class, where automation is likely to reduce jobs that are often said to be dull and boring, there was still a high number of 66% who enjoyed work, and only 23% who did not. Over 60% of the working class also said they would like to continue in their current job even if they could have an alternative at the same pay.

Despite the overwhelming number of poeple who said they enjoyed work 40% said they would be willing to give up work provided there was no loss of pay.

Tories drop tax credit plan due to computerisation snags

CONSERVATIVES have given up a plan to introduce a tax credit system because of the difficulty of computerising PAYE. The proposed system, which would replace personal allowances, could only be implemented by computer owing to its complexity, and party planners now accept that PAYE could not be automated during the life of the next Parliament.

The Inland Revenue, in its last annual report, stated that no PAYE computer system could be working before the mid-1980s (CW, Feb 9). Tory researchers have confirmed this in discussions with Inland Revenue and DHSS officials.

Patrick Jenkin, Tory spokesman on Social Services, told CW that all parties are agreed it is unfair that people are better off unemployed than working, because short-term benefits are not taxed.

The tax credit scheme was the party's proposal for getting round this, he said, but it had had to be shelved because of the difficulty of implementing it by hand.

The party has come up with an alternative scheme for taxing short-term benefits, Jenkin said. However, he agreed that any major structural change must be preceded by some form of computerisation.

Itel to build new US plant

FOLLOWING rapid expansion of Itel's IBM plug-compatible business, the company is planning to build a 1,000 square foot plant in Rancho Bernardo, Southern California which will serve primarily as a research and development centre and will also be used for some assembly and manufacture.

A spokesman for the company in San Francisco told Computer Weekly that Itel had developed some devices, including a controller for the Siemens laser printer, and that this kind of activity would increase.

"We have no commitment at this time to make processors ourselves," he said. "We need the new facility because we are running out of space at our Sunnyvale plant. We anticipate that the bulk of our products will continue to come from other manufacturers."

He confirmed that Itel is discussing with Hitachi possible configurations of the new super-large M-200H system launched in Japan last month (CW, September 21), and indicated that the new machine, which comes with from one to four processors, could form the basis of more than one model in the Itel AS series of IBM plug-compatible CPUs.

VAX-11/780 memory enhanced

MAXIMUM main memory on the Digital Equipment VAX-11/780 32-bit minicomputer, announced last autumn (CW, October 27) has been expanded from the original 512K-words to two Megawords, and the company has switched from 4K to 16K-bit memory chips. One Megabyte of the new memory costs $35,000 in the US.

A systems implementation language, Bliss 32, has also been added, designed for writing operating systems, compilers, database systems, communication and other system software. It will be available in the US in January with a once-only licence fee of $12,000.

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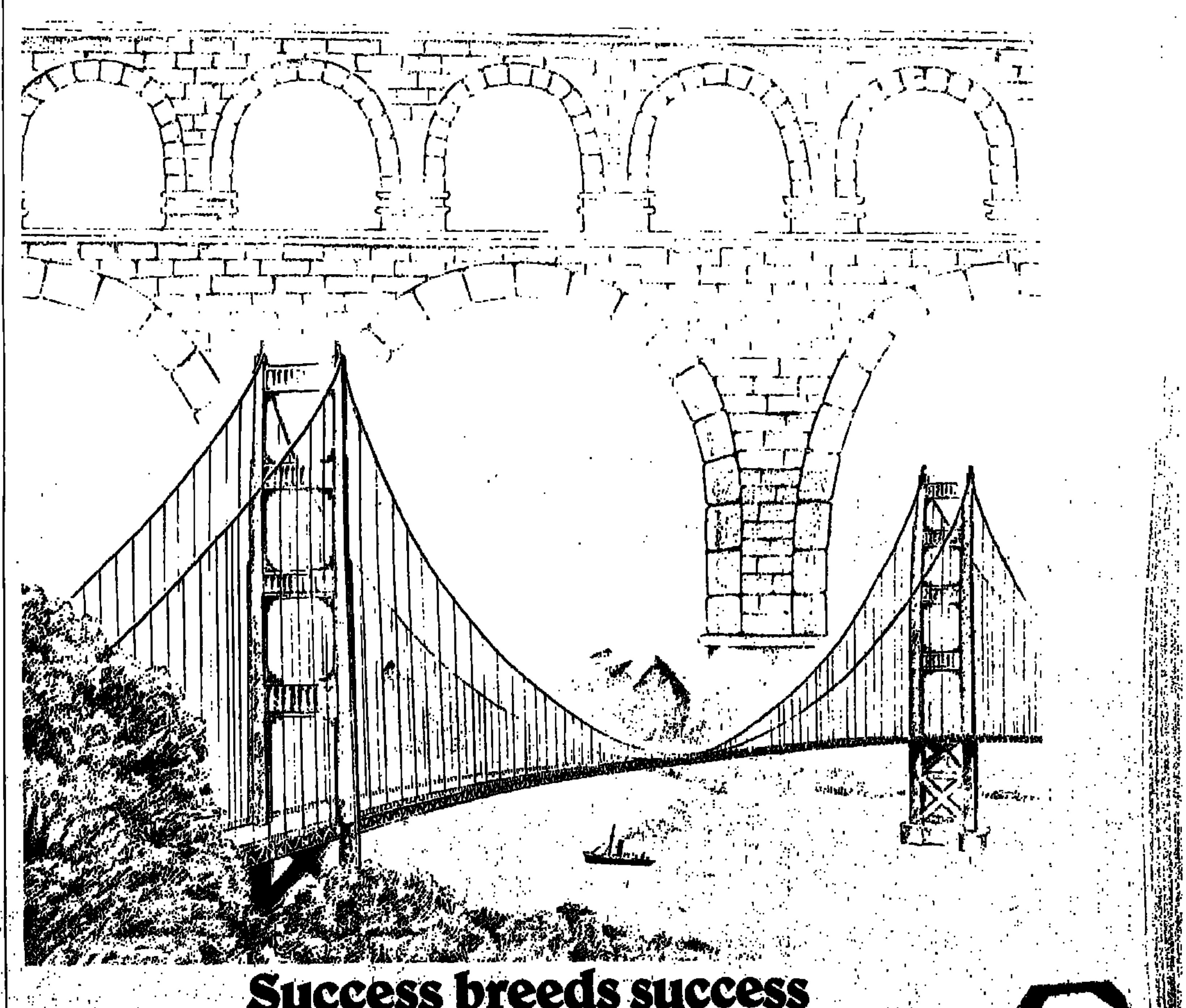

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Downtime

The games people play...

FOND memories of days in the back row of the classroom playing battleships instead of unearthing the mysteries of algebra, returned to me while Computer Weekly office was filled with the bleeps and KERPOWS emitting from the new micro-based version of battleships (page 15).

The electronic sounds of missiles being fired and the explosions and flashes registering a hit, could drive many parents loony over Christmas but, like peanuts, it is a game that drives you on to have more and more.

In fact, Battleships does nothing more than those trusty old pencil and paper kits but it does make it more exciting. And it is a useful training aid for any aspiring data prep operators, because the keying in of the positions is a pretty laborious job — particularly when you get it wrong.

Although I found Battleships irritating in many respects, I did not find it as silly as Logic 5 (see also page 15).

All that this device does is to think of a three, four or five digit number. While you are guessing it, it tells you how many digits of your guess are in the target number and how many are in the correct position — something like a numerical Mastermind without the colourful pegs (I refer to the packaged game of Mastermind, of course, not the BBC TV Game; Magnus Magnusson is not noted for his colourful pegs).

In order to remember your guesses with Logic 5 you are provided with a pad; you supply your own writing implement.

This has prompted me to think of pursuing a new career in which I think of a number, then get someone to try and guess it.

I then tell the person how many digits he/she has right and how many in the right position.

And, hey presto, I become a living game.

Perhaps I could hire myself out at £18.95 a time.

● For more on games, see pages 13 to 17.

WHEN YOU LEAVE SCHOOL THIS YEAR WILL YOUR TYPING CAREER NO LONGER BE THERE WAITING?

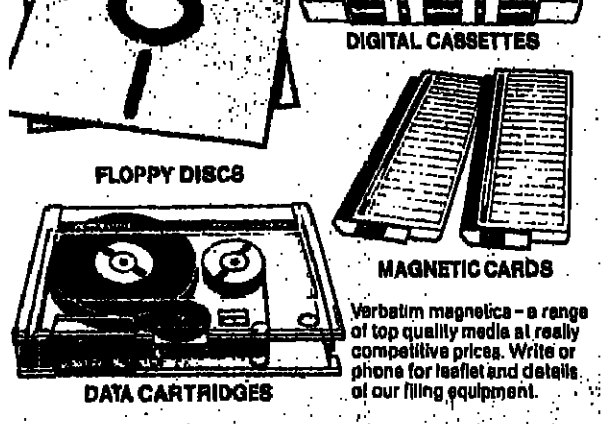
IF 2,000 WORD PROCESSORS ARE SOLD IN AUSTRALIA THIS YEAR EACH ONE "can be expected to replace 2½ to 5 typists. In certain circumstances, an even greater number has been replaced" — Rydges, page 111, June, 1978).

COMPANIES WHO CARE FOR FUTURE JOBS OF AUSTRALIAN YOUTHS BUY TYPEWRITERS

TYPISTS ARE CONSUMERS . THE UNEMPLOYED ARE COSTLY

IN the micro revolution it looks as if the worm is beginning to turn. The above advertisement appeared in an Australian newspaper to coincide with an office equipment show in Sydney. Nobody knows who placed the ad, but I'm sure it was some disinterested philanthropist, not a typewriter manufacturer.

magnetic media from WILLIS



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Changing role of the field engineer

By Peter Packham

The modularity of micro-based systems has reduced the need for expert on-the-spot repairs, but the part played by the engineer is still important. Peter Packham, training officer with System Industries (Europe), here describes how the engineer has adapted to the present needs of the industry with speedier diagnosis and increased output.

UNTIL fairly recently the single most important objective in customer engineer training in the computer industry was to instil the greatest possible amount of technical knowledge and comprehension in the minds of those being trained.

With the heavy investment in high technology products, budding customer engineers were trained to develop an insight based on a high level of knowledge, and had to acquire a command of basic principles which could be applied to repair and maintenance problems in the field. Fault rectification frequently involved the replacement of discrete components on site.

In the days of National Service, the three Forces provided an ample flow of technicians thoroughly trained in electronics and just ripe for the burgeoning young computer industry. There was a good match between the technologies in use in both spheres; not surprisingly, things have now developed very much along the lines in use in the military one.

The fact that this style of maintenance was very costly seemed of small importance in those glamorous days when even a small computer with its peripheral devices occupied several man-sized bays, and demanded a room to itself with a special environment thrown in for good measure.

Gradually this state of affairs changed. The industry took stock of itself and began seriously to assess parameters such as throughput and efficiency and to weigh these factors against cost.

Technology played a major part in meeting the demand for cheaper, more reliable systems. With the advent of the minicomputer, the trend took a quantum leap forward. Peripheral designers had to follow suit to provide low-cost devices to match the cost and performance of the minicomputers.

Software developed hand in glove with the new hardware to place previously undreamed-of computing power in the corner of an ordinary office, at a fraction of the price that would have been paid for the equivalent system just a few short years previously.

The phrase "cost of ownership" was on everybody's lips, and now the spotlight swung towards the cost of maintaining these new systems. The system may have been reduced in price, but engineers had become more expensive over the same period.

Furthermore, with more and more systems installed and fewer new technicians/engineers becoming available each year, the engineers that were to be had became even more expensive due to the operation of the laws of supply and demand.

Equipment dealers responded by designing out the need for routine maintenance as far as possible. Mechanics became simpler and more reliable with the help of more associated logic made possible by low-cost integrated circuits. Microprocessors appeared, and now turn up in the humblest of peripheral devices to provide better control of mechanical sub-assemblies than ever before.

Reliability up — cost down!

So, can we do without field engineers altogether? Of course the answer is no way, at least not yet. Even the most reliable equipment breaks down sometimes, and the need to get it running again rapidly is as important as ever. Indeed, some users get so used to the very high level of equipment availability they regularly experience that the occasional failure is treated like a major catastrophe.

What has evolved, however, is a whole new style of field support, and with it a new breed of field engineer. His training has had to move parallel with this trend so that today's training syllabuses and course objectives are quite different from those of a few years back.

The great majority of today's field engineers are highly mobile and have to cover a lot of ground in a day. To make up for the fact that the engineer has to take time travelling to a breakdown, the time allowable to diagnose and repair the equipment has to be foreshortened dramatically. In this he has been helped by much improved diagnostic techniques and programs, together with modular hardware design using readily exchangeable plug-in sub-assemblies.

There just is not the time for the engineer to diagnose the fault beyond the defective module. The case of a service visit lasting just a few tens of minutes is a common one, and often the field engineer will not even have brought his 'scope in from the back of his car.

Perhaps, then, the field engineer has become a mere "plug-in merchant" and the need for training reduced to the locations of modules and the running of diagnostic programs? Fortunately for the field engineer satisfaction, this is not general case. It is just th has had to reduce his de dence on one set of skills of in-depth circuit analysis tactile skills associated mechanical adjustment electronic component rep ments, for another set.

Many field engineers their new skills even rewarding, since they are directly to the increasing sys complexity and compu power associated with to run-of-the-mill system.

Increasingly they get their satisfaction from solving sp bugs which take them into intricate relationships betw hardware, software and fi ware. And, of course, they always have the challe human relationship prob with the people who actually the machine and could no sibly ever have hit the wr button!

So, gone are the days w field engineers on trai courses were regularly s jected to detailed descript circuits transistor by tra and chip by chip. How they ever expected to retain wealth of information me anyway.

Today's enlighten programme will concen more on the practical aspe routine adjustments where th still exist, and on module id tification and replacem Circuit analysis will mostly taught at the functional l with the aim of permitting diagnosis of a failure to a assembly.

A lot of time will be devote considering the device as part the total system and to its in action with other devices. M attention will be given to the and full exploitation of diag tic routines. Operating sys will be discussed and their logging and reporting struc explained. The interpreta software dumps is likely covered.

No regrets, then. The new results from a more prag approach to computing everyone benefits along way.

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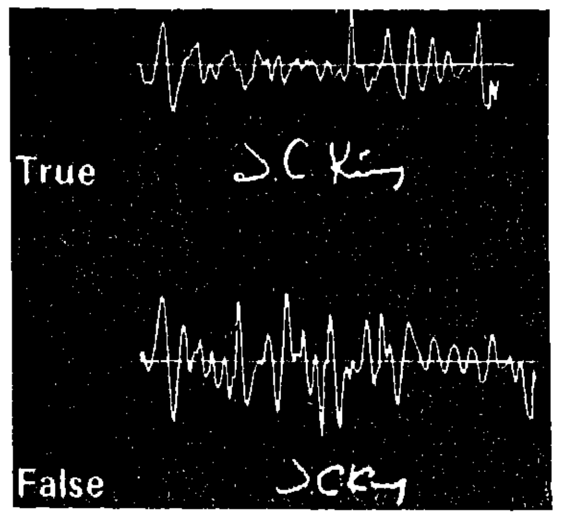
Detecting signature forgeries

A SIGNATURE verification system has been developed at IBM's Research Division in Yorktown Heights, New York, and has given the best performance of any known system, the company claims. Field trials over five months resulted in 1.7% rejection of true signatures and 0.4% acceptance of deliberate forgeries.

Rather than attempting to recognise the pattern of the signature, the equipment measures the acceleration of the pen and the writing pressure, by means of small detectors built into the pen's barrel. These values are compared to reference data stored previously, and accepted or rejected as appropriate.

According to the company, "Studies have shown that rapid handwriting of familiar patterns, such as one's signature, becomes habitual to the extent that the timings of the muscular movements are consistent and beyond deliberate control." Hesitations are revealing in detecting forgeries; hence the value of the accelerometers.

●Pictured right are two apparently similar signatures, written with a special pen connected to a computer. Although the signatures appear to be a close visual match, the patterns of acceleration (changes in speed and direction), and pressure exerted by the pen as recorded by the signature/verification system while the two signatures were being written, are quite different.



Honeywell Scots plants accept 5% plus productivity deal

AGREEMENT has been reached between Honeywell and its Scottish workforce on a new pay deal, after three weeks of negotiation and a threat of industrial action by the 1,500 men.

The company's latest pay offer, a 5% increase on basic pay and a self-financing productivity scheme, was put to the vote at two separate union meetings last week, where the men were represented by the Electrical Trade Union and the Amalgamated Union of Engineering Workers.

Details of the offer have been given to the Department of Employment which said that it was "within the spirit and intention of present government guidelines."

Australian order

CODEX CORP is to supply 9,600 bps modems valued at over $500,000 to the Australian Telecommunications Commission. The Commission, which has selected the Codex LSI 96/V.29 as its standard 9,600 bps modem, will provide the devices to leased line subscribers to its Datel service.

Printers go back to hot metal

AS a result of a refusal by National Graphical Association compositors at the Nuffield Press, in Cowley, to use computerised phototypesetting equipment worth over £200,000, the company has returned to its traditional hot-metal printing production process.

The equipment being blacked by the NGA members, as part of the union's national policy against the introduction of such new technology without extra payments, is a US-produced Delairco APS 5 system.

Nuffield Press produces brochures, parts lists and manuals for BL Cars

Norwich Union net links 35 offices

A COUNTRYWIDE network linking 35 branch offices to an IBM 3032 in Norwich is to be set up by Norwich Union Insurance, using terminal systems and modems ordered from Data Logic for just under £1 million.

The 3032 is to be installed in December, supplanting three ICL 1900s (CW, January 12).

Data Logic is the new name for Raytheon Cossor, which bought the software house called Data Logic last December (CW, Jan 5). The 40 terminal systems are the PTS 100 hardware, each of which consists of a purpose-designed minicomputer driving on average four dumb VDUs. Seventy-five printers are also included in the order.

Intertel modems and the *Intertel EMS Network Control System are also being supplied* by Data Logic. The PTS 100s will emulate SNA versions of IBM's 3274 terminal systems. Later some of the processing may be transferred to the PTS 100 CPU.

Handling of Norwich Union's home and motor insurance policies will be done entirely online with the new system, and this is expected to provide sizeable benefits of speed and accuracy. Policies, renewal notices, etc will be printed out automatically, together with management statistics on sales and costs.

The ICL mainframes will be phased out over the next four years.

Norwich Union's decision to switch to IBM rather than upgrade to a 2900 was a considerable blow to ICL, and was caused partly by disagreement over ICL's levy on plug-compatible equipment attached to its machines.

CTL uses bit-slice micros on 8040

A MAJOR redesign of Computer Technology's basic 8000 series processor, planned to be the basis of the company's product line for the next decade has been announced by the company.

The new processor uses bit-slice micro technology, and while retaining full software compatibility with its predecessors, features several innovations which will enable the power range of the line to be greatly increased.

The new 8040 model approaches the power of the old technology 8050, but costs about as much as an 8030.

The new CPU uses five AMD 2901A four-bit bit-slice microprocessors, the fifth being used to enable a theoretical limit of eight Megabytes of main memory to be addressed directly. The limit on the 8040 is 224K bytes. The system is built around a 56 Megabit per second data bus 32 bits wide, and memory is organised in 32-bit words.

A number of specialised controllers have also been developed which attach to the bus. Two AMD 2901As are used in a new high-speed disc controller, and a floppy disc controller, terminal controller and controllers for printers, tape drives, card readers and other medium and low-speed peripherals have been developed, each built around the Motorola 6800 microprocessor.

The floppy disc controller also includes a system checkout routine using a similar approach to that adopted by IBM for Series 1. Light-emitting diodes are used to indicate the status of each part of the system.

The 8040 at present uses 4K-bit memory chips, and is overall one-sixth the size of its predecessor.

Priced at between £45,000 and £100,000 including the Modus 4 operating system, the 8040 supports up to 192 Megabytes of disc storage and up to 25 video and printer terminals. It is field-upgradable from the new 8020 small, low-cost processor, which uses the same basic bit-slice CPU.

Compilers available under Modus include Cobol, Fortran IV, Coral 66, and Basic, and communications protocols supported include IBM 2780 and Hasp, ICL 7020 and CTL's own 8660. The 8040 is expected to compete with ICL's 2904, DEC's PDP-11/34 and Data General's CS/40.

Five new EMI scanners

IN an effort to recover from the worldwide downturn in sales of its X-ray scanners, EMI has introduced a new range of five machines including a low-price model for £136,000 and a "nutating" feature to reduce dosage. Resolution on the whole-body machines is improved and an advanced system which combines diagnosis with computer-assisted planning of radiotherapy has also been announced.

In its fight against US competition, EMI is suing General Electric for allegedly infringing its scanner patents. EMI already has similar suits in motion against Ohio Nuclear and Pfizer Medical Systems. There are now 17 companies making scanners in the US, and they have all been severely hit in the last two years by cutbacks in government spending.

'Culture shock' warning

THE education system needs to "strain every sinew" to help prepare the community to come to terms with new computer technology; otherwise there would be an "unprecedented culture shock." So said Gordon Oakes, Education Minister, at the opening of Huddersfield Polytechnic's new ICL 2960 last week.

"The government has accepted that much needs to be done immediately to deal with the urgent problems that are now actually upon us," Oakes said, adding that shortage of skilled people is the greatest constraint to the spread of the new technology.

"This calls for a greatly expanded programme of training and re-training," the Education Minister said.

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GILB'S MYTHODOLOGY

Who is ready to put 'architect' on his calling card?

COMPUTERISED systems are not yet famous among management or the general public for the impressiveness of their design or architecture. Certainly any system with a large impact on society requires very good architecture.

All systems have some "architecture" even if by default. Good architecture is the result of conscious and skilled planning of a system. It is usually noticed by users of the systems because they are so much better in many ways than comparable systems.

How many of our professionals consider themselves to be system architects? How many give that as their occupation or have it on their calling card? (I do, by the way.) How many are specifically trained to be system architects? What books are written on the subject, what training courses given and what professional societies have system architects (of computerised systems) as members?

Architecture is a design discipline at a broader level than what we might call sub-system engineering, which again is at a broader level of consideration than programming, testing or other construction work.

I hope that some readers fancy becoming true professional system architects. I hope that some managers are willing and interested in training this level of employee. We have a reasonable model of what it is and what it is not in the building architect, who at the level of a large building is truly a systems architect.

What I see in the real life of the DP world is a gang of carpenters and electricians (ie programmers) who are expected to be engineers and architects, without the training or organisation or time to actually do so.

They specify some arbitrary system construction, the main characteristic of which is that it might, with a little tuning, actually function at a not totally intolerable level of cost, time, human effort or unreliability, before it has to be torn down and built anew.

Has anybody in this business produced a design which will be admired as an example of good architecture in 50 or 5,000 years?

There is one area of data systems architecture which can illustrate what I mean. It is the interface between the human user and the data system; the input codes or procedures, and the displays and reports. I find that these are universally "designed" for the convenience of the bricklayer (programmer) rather than the user.

This is not surprising when the architecture is turned over by default to a bricklayer. We need talented bricklayers but we also need design functions to decide if and how brick shall be laid at all.

One of several factors holding back the development of data architecture is the inability (training problem) and unwillingness (management and motivation problem) to specify system needs at high goal levels (example: any driver can learn the online terminal system in less than a day on the job) which are then turned over to the architect function to solve in a balanced way with other partially conflicting goals such as cost and work capacity.

I put "System Architect" on my visiting card to try to explain what I do in my work. But with the self-declared title comes a responsibility to demonstrate to professional colleagues that there is a real difference between a systems architect and an analyst-designer.

I feel lonely professionally, and I'm looking forward to exchanging professional information with others who feel ready to put "architect" on their calling cards, even if it is just a challenge to themselves, and a hint to their bosses.

LETTER TO GILB'S MYTHODOLOGY

Documentation project

I SHOULD like to congratulate Tom Gilh on his article, Standards less important than standard of documentation (CW, September 7), and at the same time to seek the help of your readers in a new NCC project.

I agree wholeheartedly with the starting-point of the article, that documentation is not a goal in itself. We have always emphasised that documentation serves purely as a means of communication, between people — analysts, programmers, operators, users, management — and between the present, when systems are being developed, and the future when they will need to be maintained.

Documentation is a by-product of the design and development process, not the end-product. This is why NCC Documentation Standards are offered as tools to aid the process and to meet the need for communication.

Nevertheless, documentation can be a chore, especially during the maintenance stage, when even a simple change may involve significant alteration to written procedure and data specifications, sometimes to the extent of rewriting whole sheets.

NCC is about to start a new project, **Computer-based Documentation.** We want to explore the different ways in which information about systems and programs can be conveniently produced and maintained, using all the means that technology offers.

We are interested in the whole range, from simple methods of recording essential information right up to the sophisticated automated self-documenting systems. The end-product, it is envisaged, will be a publication which describes and evaluates the different approaches and gives guidance on how any organisation, large or small, can take advantage of modern techniques.

Our aim is to "transfer technology" by drawing together what has already been done. Much has been written, but there is no substitute for the real experience of those who have actually taken some steps towards mechanised methods of, or alternatives to, documentation.

If any of your readers have ventured into this field, I should appreciate any information or help they can offer.

J. G. RICKERBY
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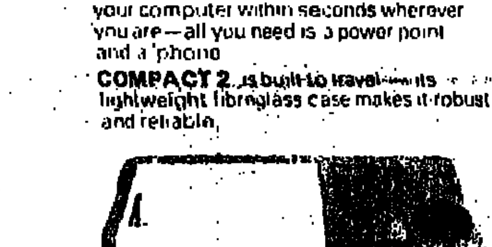
NCC,
Manchester M1 7ED



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PROGRAMMER NOTES

When things go wrong

"THIS program's gone wrong; it worked correctly last time and I haven't changed a thing" is a not infrequent complaint from some programmers. And we have all surely at one time repeated a job without change in the hope of obtaining a different — and more acceptable — result.

Intermittent hardware faults are not of course unknown, though nowadays the frequency of relevant failures hardly justifies more than a very occasional re-try.

A few years ago, correspondents to Programmer Notes argued that user written software could on occasion be used to double check built-in hardware monitoring (see for example July 17, 1975).

An anonymous contributor has now re-opened this subject, albeit scathingly, with a contribution that suggests that the scope for such checking is easily misunderstood.

He writes in the context of a memo sent by the director of his installation, the "International Computing Centre," to "all users." The memo reads:

"We have been notified by IBM that a hardware error existed in our 370/158 which could have resulted in incorrect program executions. IBM is unable to state which programs might have been affected, although we have identified over 50 jobs which were processed incorrectly as a result of the error.

"As this type of hardware error in the CPU has occurred previously, I would like to emphasise to users the importance of programming the necessary validity checks in their applications to ensure that errors, whether introduced by humans or machines, are detected."

Our correspondent challenges: "Just think of trying to check after each instruction that the hardware did the right thing. Try an example for yourself."

He continues, "It is virtually impossible in a high level language as one of the generated instructions may be executed wrong. I hope you find it amusing: this is for real and is not a joke."

SOFTWARE FILE-1

Logica boss calls on industry to face micros challenge

THE growing view that the demands of microprocessors could lead to the creation of new software development techniques was supported last week by Philip Hughes, chairman of Logica.

Speaking at Lancaster University, Hughes said that the improving cost/performance of hardware was putting pressure on the software industry to "put its house in order."

This meant in part, he said, putting "more and more effort into creating design standards and manufacturing methods more akin to those traditionally applied in the hardware field."

"We are constantly being reminded of this by the heads of the large microelectronics companies. They perhaps feel rather impatient about the increasing portion of their own budgets which is taken up in software rather than hardware."

This was a complaint strongly expressed at the NCC in Anaheim this year, notably by Bob Heikes, assistant general manager of semiconductors at Motorola (CW, June 15).

Hughes noted, however, th one could never expect softw to have the complete automated design and manu turing processes associated w the creation of general purp hardware.

This was because softw represented the tailoring of general purpose solution to t special environment of an ap cation.

Addressing the opportuni presented by the microel tronics boom, Hughes said believe that the capability of UK, and indeed Europe general, in software will be s as a more and more relev asset in the whole field microprocessors and microel tronics."

"If we can tap the capabilit companies that have becom established on a world bas these fields, then this is one g base on which to really ben from the opportunities that exist."

Cutting time-costly tasks is aim of building system

A FULLY integrated software system for building design has been developed by Applied Research of Cambridge. Called Building Design Systems (BDS) the software was evolved from the company's existing Oxsys design tool.

BDS maintains a database of building design data and provides related programs for performing many routine and time-consuming tasks. Drawing, scheduling and costing, for example, can all be completed automatically from the building definition held in the database

A major benefit of the system is that alternative or revised designs can be drawn up and costed out quickly and accurately.

The system is particula suited to applications wh make substantial use standard components, f example office blocks, ho and educational establish

Puzzler

$$AB\frac{CD}{EF} \quad GH\frac{I}{J}$$

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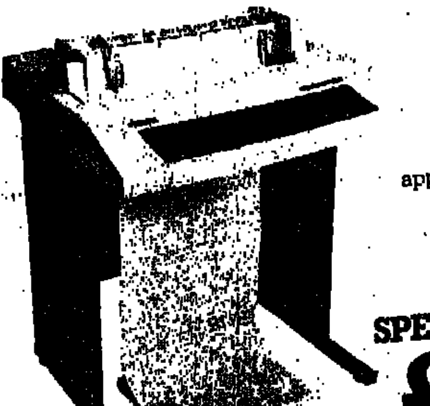

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SOFTWARE FILE -2

EDITED BY PETER HEWITT

Marcol wins £1m ESA service deal

THE European Space Agency has awarded a major contract for software support to Marcol Computer Services.

Valued at around £1 million, the contract provides for work on satellite ground station software and is described as a service contract replacing a number of contracts for technical assistance.

It is to cover a period of three years from September, 1978, and will involve between 6 and 16 Marcol staff at various times. The team will be based at the European Space Operations Centre (ESOC) at Darmstadt, West Germany.

Initial work to be performed under the contract includes both development and maintenance of ground station software for ESA's four ground stations in Belgium, West Germany, Italy and Spain.

Two early work areas specifically identified include support for the Siemens 330 component of the Multi Satellite Support System (MSSS) and support for an ICL 4/72 system that is used to evaluate in-flight data from various satellites including Meteosat, OTS-2, and GEOS-2.

The company will also begin work shortly on the satellite simulations package, which is used at ESOC both to check out satellite support systems and as a training aid.

In addition to maintenance of this package, new software is required by ESOC to simulate future satellites such as Exosat. Due to be launched in 1980, Exosat is to be used as an X-ray laboratory and Marcol's work will include the development of software both for controlling experiments and for offline processing of the data.

The company is also to develop software for Exosat spacecraft control. Involving considerable modifications to the existing MSSS software, this task is expected to occupy three of the team starting in mid-1979.

Marcol first won an ESA contract last year and began work at ESOC in June 1977. Up to now it has been involved in three principal areas: software maintenance for MSSS; development of the inflight performance evaluation system for Meteosat; and support of Meteosat imagery software.

The latter system, understood to be one of the most sophisticated in existence, was developed for ESOC by a consortium headed by Logica (CW, February 9).

SEL launches Coral 66 for its 32 Series

A Coral 66 compiler has been announced by SEL Computers for the SEL 32 Series minicomputers. The software runs under both the RTM and MPX-32 operating systems and in the latter case the compiler is re-entrant and generates re-entrant code.

In addition to conforming to IECCA requirements, significant language enhancements are supported which meet and exceed IECCA recommendations. These extensions can however be disabled at compile time to limit facilities to the official language definition.

The object code generated is highly optimised, according to the company, fully exploiting features of the range such as the extensive instruction repertoire and bit, byte, halfword, word and doubleword data types.

Catalogue enhancement in Dynam/D release

THE ability to catalogue multiple versions of a file, distinguished by generation number, is the most significant enhancement in Release 2.0 of Computer Associates' CA-Dynam/D software.

The package, which was introduced to the UK last year (Software File, April 21, 1977), implements dynamic disc space and catalogue management for IBM DOS and DOS/VS users.

With the new release, successive generations of the same file can be created and accessed under the control of a file generation number. This facility has previously been provided by IBM in its OS systems, but not in DOS or DOS/VS.

A prerequisite to use of the feature is implementation of Dynam/D catalogue management. Basically a file directory, this mechanism relies solely on DOS DLBL information, eliminating the need for ASSGN and EXTENT cards.

Also significantly enhanced under the new release is the backup/restore facility. The new utility for instance allows files to be restored selectively from a tape dump holding several files.

New pastures

A GLASGOW software house, Kesho Systems, which previously concentrated on visible record systems, has produced an accounting system running on Mael 2000 minicomputers. A single entry book-keeping system, the complete package costs around £10,500. Kesho is based at 72 Waterloo Street, Glasgow, G2 MDA. Tel: 041-226 4236.

Light view

COMPUTER programs for daylighting in buildings is the title of the latest evaluation report by the Design Office Consortium. Analysing eight of the available programs, the report is priced at £5, £2 to full DOC members.

Support for TP access in Resolve update

SUPPORT for teleprocessing access is the main new feature in release 2.0 of the online operations monitor Resolve (CW, November 11, 1976). The release also extends the facilities available in operating system environments other than MVS.

The new TP interface allows users to access Resolve from terminals operating under CICS and other teleprocessing monitors. An interface has also been provided for Roscoe and Tone users.

At the same time, the software has been made re-entrant so that it can process multiple service requests simultaneously.

One of the new facilities is service Sleep, which makes a job or task non-dispatchable. Subsequently cancelled by Awaken, the service is designed primarily to assist in job scheduling and program debugging.

Another extension has made Service TSO available to MVT and SVS users. Previously restricted to MVS, this service gives detailed information on the status and resource utilisation of time-sharing users.

Resolve, a Boole and Babbage product, is priced from £3,100 to £10,540 depending on system and site requirements. It is marketed in the UK and Europe by The European Software Co (Software File, May 18).

● The European Software Co has now established a UK office at Kingswick House, Sunninghill, Berkshire. Tel: 0990 23491.

Pansophic tops $10m revenue for first time

ANNUAL revenue in excess of $10m has been achieved by the software products company Pansophic for the first time. The rise, from $7.1m in 1977 to $10.4m this year, represents a 45 per cent increase and follows a 41 per cent increase last year.

The company, which is privately owned and in its ninth year of operation, is best known for the Panvalet source statement management system. It installed its 5,000th product a few weeks ago with a joint delivery of Panvalet and Easytrieve to a customer in Dallas, Texas.

Another recent success was scored by the company in Datamation's Brand preference study of the data processing industry. For the fourth consecutive year, it was named the top independent user-preferred utility software vendor.

The study, the sixth of its kind, sampled 82,820 Datamation subscribers and measured brand preference for some 97 types of DP product and service. Pansophic ranked third behind IBM and Westinghouse in the utility packages category.

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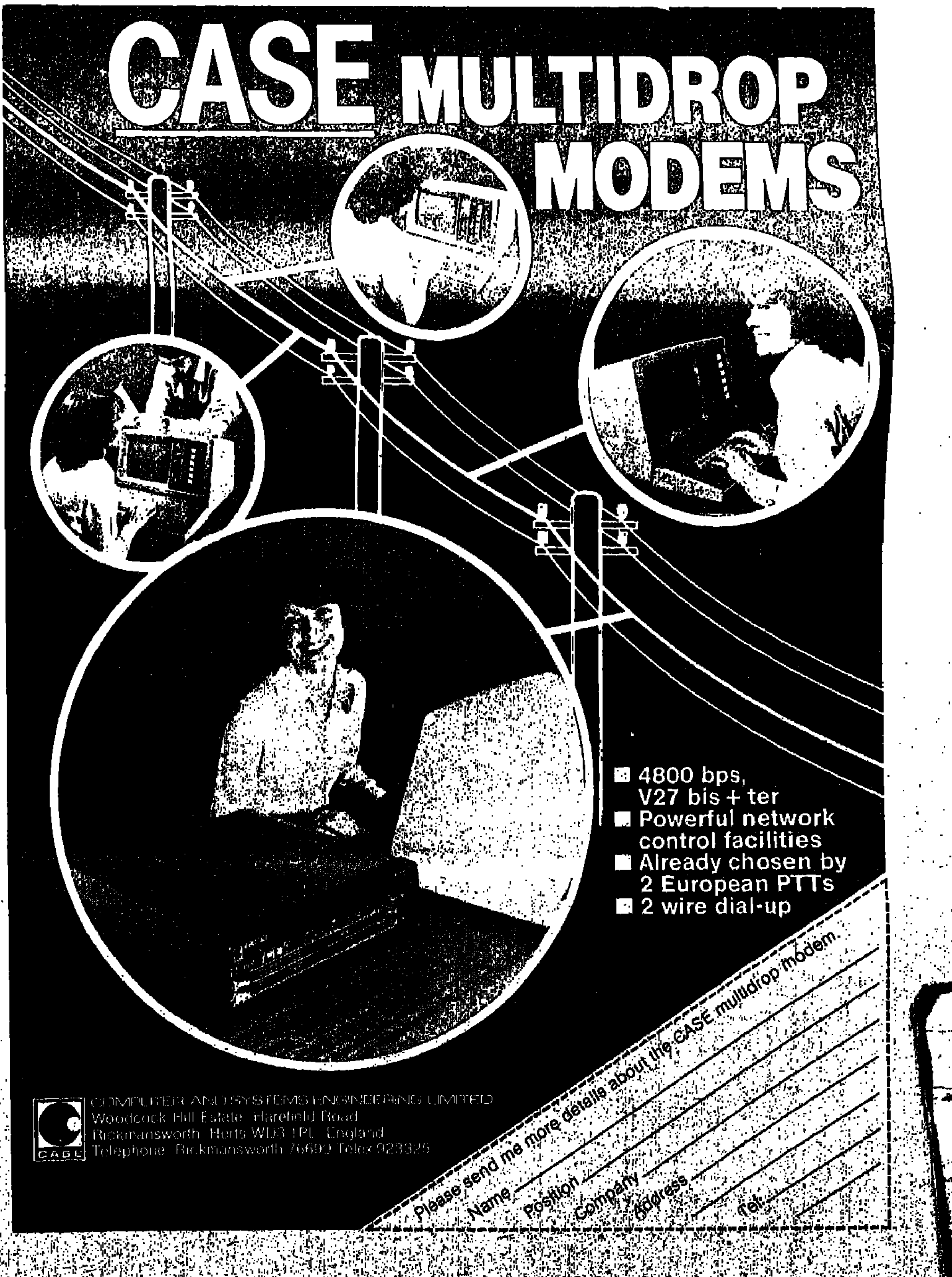

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PEOPLE AND EVENTS

Edited by Nancy Pocock

NEB director appointed to CASE

A DIRECTOR of the National Enterprise Board, **Stephen Dawson**, has been appointed a director of CASE, Computer and Systems Engineering. The NEB recently acquired 28 per cent of CASE, which manufactures data communications equipment (CW, April 13).

Dawson's first contact with computers was made while he was engaged in management consultancy with Metra in 1970. From 1971 to 1974 he worked for Logica where he advised computer companies on marketing policies, then joined Reuters as project manager developing a new international real time distributed network mainly on PDP-11s.

He joined the NEB in February, 1977 and took charge of the computer hardware systems division.

Peter Davies of Redifon Computers, previously British Rail branch manager, has become branch manager, major accounts region.

Ken Mitchell, customer services director of System Aid, has been made a partner of the firm.

Donald Soults has joined Scientific Time Sharing in the US as director of management technology, from JRB Associates Inc where he was a vice-president. **Gayle Abbott** joins STS as director of personnel. She most recently held personnel management positions with Computer Network Corp and the Food and Drug Administration.

Christine Moulang has joined the BCS at its headquarters as meetings executive. Formerly she was a conference organiser with the Institute of Purchasing and Supply.

Terry Miller, previously managing director of Computer Systems and Programming, has been appointed to the board of Haven Computer Services and will also be Haven's UK general manager.

Tony Searle has joined Honeywell as press relations manager, computer operations, from British Aerospace where he was head of the press department. **David Currer**, previously press officer for Honeywell's control systems operation at Bracknell, has been promoted to press relations manager there.

Ron Godfrey, who was formerly UK sales manager of Honeywell's residential controls division, has gone to Appliance Components Ltd as sales director.

Michael Davies, until recently London and metropolitan manager for Olivetti, has become chief executive of Adler UK. He succeeds **Henri La Costa**, who becomes company secretary and personnel manager with Adler.

Bill Hockey of Systems Designers Ltd, formerly systems manager, has been appointed operations director, and principal consultant **Tony Lennard** has been appointed projects director.

Ken Fearnside of Plessey, previously director of technology for the components groups, has been made director of strategic planning.

Keith Bevis, formerly sales manager of Wellorax, has joined Eurologic Software in the same capacity. **Mike Cannon** has joined Eurologic as project manager, from Thorn Electrical Management Services where he was DP systems manager.

Brian Dunning has been promoted from deputy head to head of training with Compower.

Malcolm Taylor has become head of the communications systems section at Atkins. Until recently he was on secondment from International Aeradio to the Emirates Telecommunications Corp in Abu Dhabi where he was operations planning officer.

Liveware Saga by Don

LOGICAL CHRYSIPPIAN FUNCTIONS....
NO,NO,NO: LUKASZIEVICIAN POLYVALENT FUNCTIONS, DOLT!
MACHINE INTELLIGENS LANGAUGE RESEARCH UNIT →
JARGON!! STOP, IT!
BUT HOW CAN WE TALK ABOUT LANGUAGE COMPREHENSIBLY...
...UNTIL WE'VE KILLED IT FIRST?
Don

Vice-president of Telex

A UK VICE-PRESIDENT has been appointed by Telex Computer Products, which forms the major part of the US Telex Corp. He is **Nick Swallow**, managing director of General Computer Systems UK which has been taken over by Telex.

Swallow

Swallow's career in DP began with Litton Industries and continued at Honeywell, where he was Southern regional manager for the data entry division. In 1971, when the merging of Honeywell's computer interests with those of General Electric led to an emphasis on the mainframe side, he decided to stay with data entry systems, and joined Interscan.

He became sales director, and after the formation of GCS from Interscan in 1976 was made managing director, a position he will retain in addition to his recent appointment.

Paul Perowne and Philip Meader have joined System Industries Europe in Woking as field service engineers. Perowne was formerly with Data General and Univac, and Meader was with Midland Business Machines. **Holger von Smolenski**, previously with Memorex, joins System Industries Deutschland as field service engineer.

A course from the BCS on structured systems

AS in previous years, the London branch of the BCS is holding a course in South Ken. This one will be on structured systems development and quality control and will cover structured/composite systems design and structured coding, all-paths validation and walkthrough.

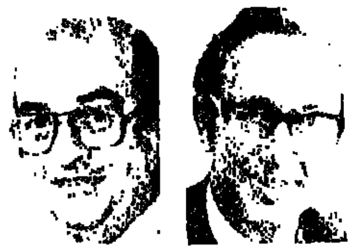
John Parker of Simpact Systems will present the course, which takes place on November 21-22, and the fee is £30 for BCS members, £40 for non-members.

For details and to register, call Rob Chilton at the BCS, 01-637 0471.

Director for Slinn

A FORMER Burroughs man, **George Hobart**, has been appointed director and general manager of the Dronfield, Sheffield-based Slinn Computer Group.

The group has four member companies and Hobart, 46, a former marketing manager with Burroughs, will be responsible for the day-to-day running of them. The founder, Mike Slinn, will be chairman of the group.


Hockey Hiller

Bill Hillier, formerly production director of Racal-Redac, has been appointed technical director.

Geoff Humphrey, formerly a senior partner in Pensions and Insurance Computer Services, PICS, has been made head of the PICS unit in Unilever Computer Services following PICS' takeover by UCSL.

Hitchin office

THE Dataproducts supplies division, previously based at Reading with the rest of the company, has moved to its own office in Hitchin.

The address is Dataproducts Supplies Division, 26 Tile House Street, Hitchin, Herts, and the telephone number is Hitchin (0462) 31131.

"Computer Weekly", "Data Processing" and "Systems International" present

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10 am to 6 pm (closing at 4.30 pm on the last day)

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Baydel
Benson Electronics
Borer Electronics
British Olivetti
Bunzl Data Systems
Byte Shop
Computer Automation
C. ITOH
CAP Microsoft
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DIARY

OCTOBER 10

Meeting. BCS Data Communications Group. City University, London EC1. 18.45. Details from group secretary.

X-series protocols made plain. Roger Scantlebury. BCS Data Communication Group. City University, London EC1. 18.00.

A computer in your future car. Mike Loasby. BCS, Reading branch. Copper Inn, Pangbourne. 20.00.

How will industry adapt to microelectronics? Dr Brian Spratt, Prof Michael Lanigan. BCS Kent branch. Computer Lab, University of Kent at Canterbury. 19.45.

Computer education in Essex schools. B. Jackson. BCS Harlow sub-branch. Harlow Technical College. 19.30.

Training computer staff. J. Errington. BCS Birmingham branch. Priory Dene Hotel, Birmingham. 18.30.

OCTOBER 10-11

Small systems group meeting. IBM Computer Users' Association. White House, London.

OCTOBER 10-12

[illegible] process simulation and design. CAD Centre, Cambridge. Further information from Dr P. Winter; tel 0223 63125.

OCTOBER 10-18

Efficiency Beurs, 10th international exhibition of office equipment. RAI, RAI Exhibition Centre, Amsterdam.

OCTOBER 11

Aspects of an office of the future. BCS Newcastle-upon-Tyne branch. Barras Bridge Bldg, Newcastle University. 19.00.

OCTOBER 12

Structured programming, HIPO v Michael Jackson system. Don Wilkinson. BCS S Essex branch. West Cliff Hotel, Westcliff-on-Sea. 19.45.

Microprocessor 2, applications in business and personal computing. BCS S Yorks branch. Heriot House, City Polytechnic, Sheffield. 19.30.

OCTOBER 13

Cleaning maintenance problems seminar. National Computer Complex Cleaning Committee. Piccadilly Hotel, Manchester. Details; CCCC, tel: 01-407 2304.

OCTOBER 17

How to use computers in spite of computer programmers. E. A. Newman. BCS Croydon branch. Fairfield Halls, Croydon. 19.15.

OCTOBER 17-19

Computer measurement conference. Ecoma-6. European Computer Measurement Association. London.

OCTOBER 18

Personal computing forum/Demonstration, wine and sandwiches with CW. IDPM. Imperial Hotel, London WC1. 18.00.

An introduction to structured programming. Gill Blay. BCS Cobol Group. BCS HQ, London. 14.15.

Managing a small DP unit. BCS Kingston-upon-Thames branch. Regional Management Centre, New Malden. 16.00. Details T. Vickers 01-894 4866.

Who represents the computer professional? E. Cluff, Tim Webb, Derek Harding. BCS Kingston-upon-Thames branch. Regional Management Centre, New Malden. 19.30.

Distributed data processing. Tony James. BCS Sussex branch. Gatwick Manor Hotel, Gatwick. 19.30.

The future of large-scale computers. Prof Frank Sumner, BCS president. BCS Manchester branch. Manchester University Regional Computer Centre, Manchester. 18.30.

OCTOBER 18-19

The computer revolution, industry and people, conference. BCS/IMechE/IEE/IProdE. Institution of Mechanical Engineers, 1 Birdcage Walk, London, SW1. Registration required 01-839 1211.

OCTOBER 19

Optical image processing. BCS/Institute of Physics/British Pattern Recognition Association. Blackett Lab, Imperial College, London SW7. 14.00.

Visit to Ministry of Agriculture. BCS Guildford branch. Guildford. 19.30. Numbers limited, contact C. P. Karney, 0483 70887.

Prestel, the Post Office's viewdata. Bryan Dew. BCS West Herts branch. Heath Park Hotel, Hemel Hempstead. 19.30.

Computerised medical records, the ethical position. John Dawson. BCS Coventry branch/BMA. Lanchester Polytechnic, Coventry. 19.30.

Computer-aided farming. William Begg-Lorimer. BCS Aberdeen branch. College of Commerce Lecture Theatre, Aberdeen. 19.00.

OCTOBER 23-25

Mini and micro forum. Online. Brighton.

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Simplifying page make-up

THE make-up of pages of pictures for printing is greatly simplified by an automated, digitised system produced by Crosfield Electronics.

Called the Magnascan 570, the machine digitises colour photographs, holds them on disc, and allows an artist to assemble them into pages using a light table and a VDU instead of the traditional scissors and paste.

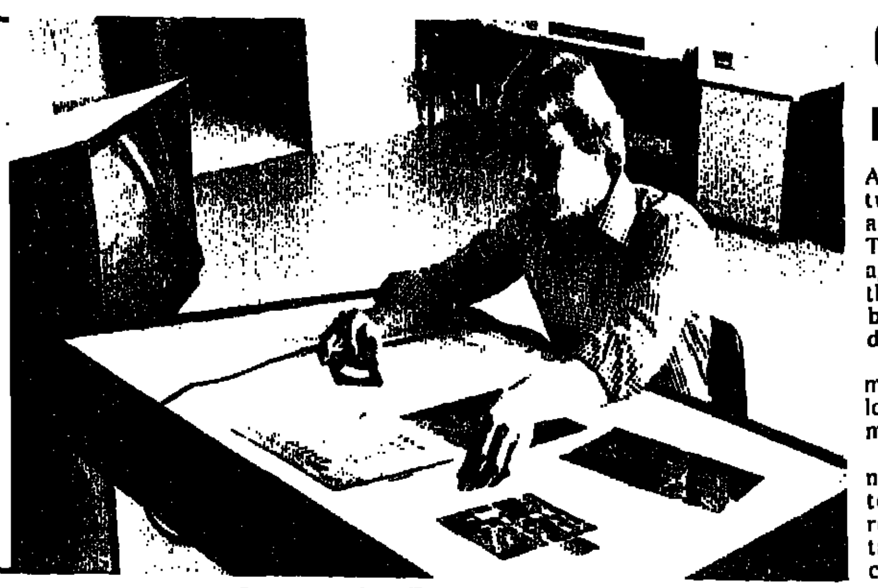
The scanner consists of a light, filters, a photocell, and a rotating drum to which colour transparencies are taped for input into the system. The lay-out artist then places the transparencies on the light table, and indicates where each is to go, using a cursor. A storage VDU shows him a graphic representation.

Circles, triangles, rounded corners and other geometrical shapes can be put in automatically, as can borders in any required colour.

When the page is complete, a single set of transparencies, one for each colour, is produced on a second "output" drum in the scanner for making the printing plates.

An additional aspect of Crosfield's digital picture system is a technique now being worked on to make gravure printing plates by vapourising the surface of a plastic sheet with a laser.

● The planning operator is pictured using the cursor in conjunction with the command menu to assemble the art work according to the customer's lay-out on the planning table.



CTL profits nearly double

AFTER three years in which turnover remained static at about £4 million, Computer Technology is on the move again. In the year to April 1978, the company did £5,032,000 of business, and profits almost doubled to £336,000.

For the current year, managing director Bob Finch looks for turnover of at least £6 million, and profit of £500,000.

CTL did 48% of its UK business with commercial customers, and this sector represents 64% of the orders taken in the first half of the current financial year.

Benchmarks show 303X results beat claims

PERFORMANCE specifications better than those achieved in benchmark tests are claimed for IBM's 303X mainframes in a report published in Industry Measures. This gives test results showing that a 3031 running under MVS/SE can handle 35% more processing than a 370/158-3 under VS/1.

However, the report says that when both machines used similar operating systems the 3031 showed a 14% to 18% increase in throughput compared to the 158-3. This figure is in line with IBM's claimed 13% to 24% improvement when the 3031 used MVS/SE.

Industry Measures is published by the Technical Analysis Group of Advanced Computer Techniques of New York, and its report goes on to point out that a 3032 will perform 2.6 to 3.1 times the work of a 158-3 with comparable operating systems and that the machine will do even better with MVS/SE. Compared to a 168-3, says TAG, a 3033 delivered 1.8 times the throughput without MVS/SE, and 2.1 times as much when MVS/SE features were added.

This indicates that "the potential increased processing power of the 3033 SE feature (on a 370/168) nearly matches that of an entire 158."

While users are cautioned by the TAG report to remember that benchmark tests may not reflect the performance of any particular installation, the results of the tests cited indicate that users who migrate from the 370 machines to the 303X processors will substantially increase their computing capabilities.

In a related study, the Technical Analysis Group estimated the worldwide backlog of 303X machines to be from 12,000 to 14,000 units. With IBM's substantial shipping delays, this demand will be met in some cases by plug-compatible mainframes.

However, the rate of shipment of PCM equipment, TAG points out, is far lower than that of IBM's gear. For most users, IBM equipment appears to be the only acceptable choice.

First use of punched card equipment with System 34

PUNCHED cards were seen as the only viable way of maintaining a large number of small files of shipping documents which are accessed infrequently by Bunge, a firm of commodity traders in the City of London.

Bunge had been using cards for batch processing on its IBM System 3/10, but when the firm wanted to upgrade to a System 34 and move towards a screen based accounting system, none of the suggested media seemed suitable for its file storage. So IBM referred it to Decision Data to implement what is believed to be the first use of punched card equipment with a System 34.

Committee of MPs calls for computerisation of Parliament

PROPOSALS from a House of Commons committee for the appointment of a full-time computer officer and the drawing-up of a unified computerisation plan for Parliament, may be the beginnings of real progress in the hitherto slow process of automation of the legislature.

In a report just published, the House of Commons Services Committee recommends the appointment of a computer officer at a "fairly senior level", explaining, "Parliament needs the services of someone with training and experience in the use of computers so that it can derive the full benefit from computer applications."

The computer officer should be associated with the House of Lords as well, the report suggests.

The report also calls for a moratorium on any further computer developments in the Commons until an overall strategy has been drawn up with the help of the computer officer. The one exception to this would be the Commons Library indexing project which has already been approved by the House and which aims to transfer all the library's references to Hansard, current affairs, etc to an online system.

Other suggested uses to which computers could be put in Parliament include word processing for the production of reports, correspondence management for MPs, project control, and databases on finance. One sub-committee used a computer to store the evidence it was dealing with (CW, Nov 3, 1977) but this was only a temporary set-up.

The Services Committee's recommendations stem from a six-week study of the work of both Houses by Robert Robinson, a consultant with the Central Computer Agency.

Robinson expressed concern that the various systems the two Houses develop should be compatible — in particular, that the Commons Library system should be chosen with compatibility in mind. The library is expected to decide on the choice of a system in about nine months' time.

A common full-text retrieval package is one of Robinson's recommendations. The Commons Library is currently using ICL's Assassin software for developing a thesaurus, and according to Robinson, this would not be suitable for other applications in the House.

The UK Parliament is one of the last in the developed world to introduce computers to help its work. An information scientist, Angela Gould was appointed to the Commons Library staff in 1974 with part-time responsibility for advising on computerisation, but she left earlier this year, frustrated with slow progress.

Corrections

THE St Albans-based company, Mine of Information, has produced a list of corrections to the Adam Osborne book, Introduction to Microcomputers Volume 1 — Basic Concepts. It will supply the list, which consists of descriptions of about 30 printing errors and ambiguities in the original text, to anyone who buys the book from the company.

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LIKE some new Midas, the computer has changed everything it has touched.

Marvellous devices incorporating this electronic spark of intelligence are altering the ways in which industry functions, the way that the home runs, and even the way we think.

But as well as giving us the medium through which we can work wonders on our civilisation, the computer has also left puzzles and problems to solve.

In an effort to fathom our possible futures in more detail, Futureview Editor ROBIN WEBSTER travelled to the US to meet leading science fiction writers and discuss a range of computer-related topics.

In the first of a series of US interviews, he talks to Ben Bova, science fiction editor of the new science fiction/science fact magazine, Omni, launched on the UK market today. Later interviews will seek to explore different areas as well as reinforce some of Bova's views. They will feature Isaac Asimov, Norman Spinrad, Lester del Rey, and Fred Pohl.

Bova believes that computers can stem the downward spiral that the educational system in the US is experiencing by providing a more individual, "bespoke" touch to lessons.

He also speculates that computers might just be the adversary that man needs to keep him alert and on his guard.

Starting his working life in journalism, Bova has fulfilled childhood interests in space and science fiction by working on the Vanguard launching rocket project, in his previous position as editor of the SF magazine, Analog, and in his present role on Omni.

FUTUREVIEW IN THE USA

A revolution that will leave people free to do original work

ONE of the most insoluble dilemmas raised by the introduction of computer technology into society is that of unemployment on a vast scale caused by automation of the production cycle.

The factory jobs which humans really do so inefficiently, but for which the computer is ideally suited, are being taken over with great rapidity, but it is not a one-to-one ratio. A computer can, in common with many of our tools, do the work of many men or make possible jobs that were previously unthinkable.

Commentators of the past have warned us that we may indeed be sowing the seeds of our own destruction, but this is not a view shared by Ben Bova, fiction editor for Omni, the new international science fiction/science fact magazine.

Rather than giving us time to lead a Lotus Eater's life of leisure, he believes the computer will only increase the tempo.

"Several people have made the comparison with the Industrial Revolution which lifted a lot of the burden of physical labour from human beings," explained Bova. "The computer revolution will lift the burden of mentally dull, repetitive tasks — people should be free to do original work.

"Most of them don't at present, but there is no reason why most of them will not be able to do so.

"I don't believe that we will have more leisure time at all. My experience with the computer is that it allows you to work harder so that you spend your time doing things that you wouldn't try to do otherwise. The computer is such a wonderful labour-saving device, you can accomplish more."

It will undoubtedly take some time to reach Bova's ideal situation where everyone is capable of producing more through the focusing power of the computer, so what method could be used to deal with the millions of unemployed that currently represent a massive pool of unused production power?

Bova highlighted some ideas that had been suggested.

"There is a fairly standard science fiction scenario in which we have such a high level of automation that hardly anyone works for a living — everyone who sits around is essentially on the dole," he said.

"Now the question arises: How can that work? The answer of course is that it can't, no one has yet figured out a viable system by which we can get to a society where most people do not need employment in the sense that we now have to work for wages and use those wages to buy goods and services.

"Lester del Rey, the science fiction writer, has a lovely idea for giving unemployed people something to do. We have very blighted urban areas in New York City and many other major cities, and lots of people in these blighted cities are unemployed and on welfare.

"It would be a simple matter, says Lester, to hire these people to rebuild their own neighbourhoods. It would probably be cheaper than the eternal welfare money we pay them.

"But of course you then run into social obstacles like the unions. The trade unions would not like non-union people rebuilding those parts of the city that they themselves will never rebuild because no one would pay for it."

As fewer and fewer jobs remain open to the unskilled, the spotlight of many of them has fallen upon education, a field that Bova feels is in an "era of mediocrity" and a decline which prompted him to make some fairly damning comments about the US educational system.

"We are graduating millions, literally millions of functional illiterates," he exclaimed, "and I define a functional illiterate as someone who has a diploma but who can't read it."

However, he also believes that like the well-timed US cavalry, computers may yet save the day.

"Education is an area where I think computers can come to our rescue, because they can provide individualised instruction. They can provide information at a rate that the individual can adjust to suit him or herself. This is probably the biggest breakthrough, because more and more education is now being done outside the classroom.

"We have thousands of teachers in New York City who cannot read and write English at a high school level. In fact, because of state legislature, we have got the ridiculous situation where, for example, Isaac Asimov could not teach science fiction in a public school (state school in the UK) in this state, and even Albert Einstein would not be able to teach physics. Now maybe they'd both be terrible teachers, but one suspects that they would have something to tell the students."

Despite his optimism about the role of computers in education, Bova thinks that their current applications in the classroom, rather than helping, are almost having a negative effect.

"Computers have been used in a very bad and wrong way in education so far. They have allowed teachers to get away from work. All tests are graded by computer; even if you take a course in English literature you wind up getting 'yes/no' or multiple choice questions so that the teachers can simply feed the answers into a computer and get a rating. Essay questions which require the ability to think as well as to read and write are anathema.

"Teachers do not like to give them because they then have to read the essay and decide themselves whether a student knows the subject and makes the grade."

> ***There are new Drakes and Magellans waiting for their great voyages, and the gold and silver they will return to this earth are the tiniest part of the wealth they'll bring back.***

The reason for the misapplication of such a potent aid to education could be that we are making the wrong mental adjustments, he suggests.

"We have used computers more or less the way the original horseless carriages were built. They were designed like carriages for horses but they took away the horse..

"I remember an old [illegible] print of a fanciful design for an airship made in the days of hot air balloons, and the gondola looked like a sailboat. It had the keel of a sailboat and everything. It was an airship that would carry you across the ocean and naturally it looked like a watership . . . it's a psychological projection.

"I think the advent of home computers linked to television sets offers people an opportunity to bypass the education problem, however. With the use of an interactive computer system they can go at their own speed and one thing will lead to another.

"You may begin by getting a home-study course on fixing your refrigerator and wind up as a creative electronics engineer. The prerequisite is, of course, curiosity, which, I think most mammals have, and the ability to read — but even that may

'Adversary to bring out beast or best in us'

eventually be solved by having the computer present instructions both orally and visually.

"And I imagine the effect will be analogous to exercising your muscles. The more you use certain neural paths in this way, the more firmly established they become.

"There is an enormous interest in this country in war games; with the home computer these will become very complex. I can in fact see students cheating on the time they should be spending on their studies to play these war games, but they may very well be learning more that way than they would in subjects that they despise or are forced to take."

At a higher level, some governments now seem to be waking up to the realities of what computer technology can achieve; what sort of record of awareness has the US Government shown in this area?

"It's spotty. The Government is made up of several organisations. Some are very aware of technology and work hard to improve and incorporate it; others run screaming in the other direction.

"If you suggested to some large government bureaux that over 50% of their employees could be replaced by a couple of well-written computer programs, you would probably find yourself looking at the Potomac River from the inside."

Would large scale use of computers in US homes diffuse the power of government into the people's hands by giving them more information and a channel through which they could make quicker responses?

"I think all it would do is transfer the power more strongly into the media," replied Bova. "When everyone can vote on every issue, they will all turn on Walter Cronkite to see what he thinks about it. Maybe Daffy Duck will become the most important character in the United States."

Looking beyond the horizon, man has turned his gaze heavenwards in the hope that he may one day move off this planet to other worlds, a goal that Bova says is "the most important thing being done in the 20th Century."

"Every biological organism expands its own living area to fill an ecological niche. Now we have a technology that allows us to expand our niche completely off this planet, and it turns out we need that.

"There are two marvellous things about the rest of the solar system . . . starting a hundred miles or so above our heads: it is marvellously inhospitable to human existence and it is very rich in energy and raw materials, which means that very few people will live out there and they will return incredible wealth to the rest of us here on the surface of earth.

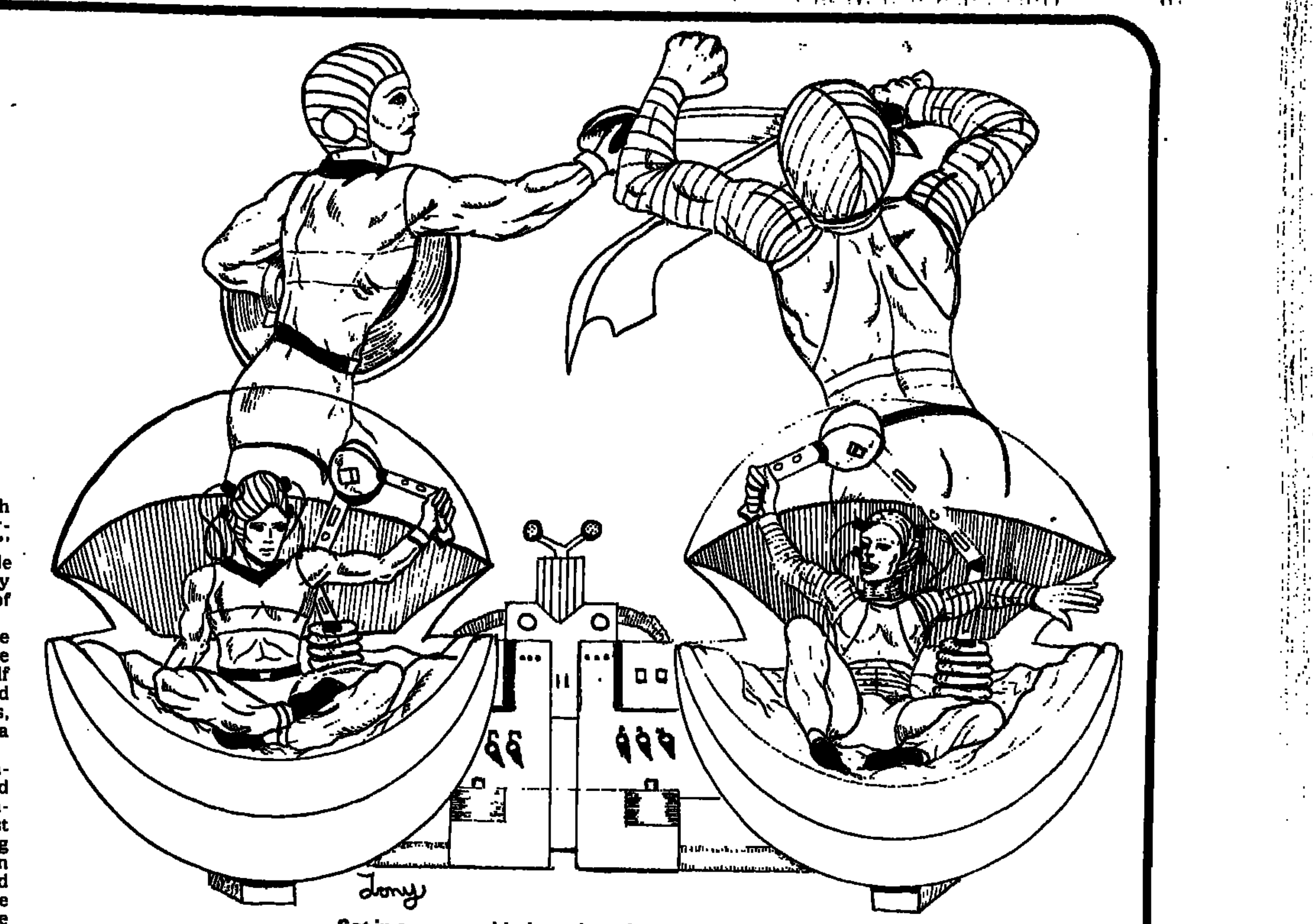
"There are new Drakes and Magellans waiting for their great voyages and the gold and silver they will return to this earth are the tiniest part of the wealth they'll bring back . . .

"And not only that. New social inventions will be made when people start living in very very harsh environments off this earth. I've written a novel about it called Millenium*."

The book features such topical devices as computer-controlled "killer satellites" armed with lasers which circle the earth and destroy enemy satellites in an orbital game of cat-and-mouse.

This "game" reflects the more serious situation between the US and USSR on the earth itself where population pressure and depletion of natural resources, especially energy, have forced a neo-cold war confrontation.

"Space is an area of exploration and technology that could never have gotten started without computers," said Bova. "Just the sheer number crunching that's necessary to launch even a simple rocket like the old Vanguard is enormous. We are in a permanent man/machine link.



Set in a very sophisticated world where violence is a thing of the distant past, the Duelling Machine allowed two people to fight a duel, to share an imaginary experience, without physical harm.

ALONE FOR A LONG TIME

BEN BOVA . . . . "we have been alone for a long time, and it might be nice to have a friend, a partner, or even an adversary — a worthy adversary which would sharpen our wits and force us to do better."

"By the end of this century there will be people grown into adulthood who will find it strange to think that there were other human beings who walked around with their unaided brains."

Popularised and partly fantasised by the TV series The Six Million Dollar Man, the concept of a cyborg, part man/part machine, certainly stirs the imagination, but how long it will remain in that realm is not certain. Bova sees the cyborg concept not necessarily as a final act, but more as a momentary, reversible one.

"Perhaps we will have temporary cyborgs. I think there will be situations in which you will want to plug into a machine — get the data directly into your brain or the experience, the emotional experience. There have also been a lot of science fiction stories written about 'AC junkies' who tickle their pleasure centres directly with stimulating probes.

"In fact, I once did a story called The Duelling Machine**, which was about a large device set in a very sophisticated world where violence is a thing of the very distant past.

"When you get into an argument with someone and you really want to throttle them you fight a duel in the Duelling Machine. The two of you are allowed, through the medium of the machine, to share an imaginary experience, without physical harm."

On the topic of minds, the one thing that our race, Homo Sapiens, believes that sets it aside from the other animals is a far superior brain, a brain that was the catalyst in man becoming the dominant species.

Not his strength, but his ability to learn to use tools, to have creative thoughts, and to plan ahead have enabled him to usurp natural law and order.

That position is now challenged by the HALs and Ultra Intelligent Machines of the future.

What effect would such creations have on man?

"I think it will frighten a lot of people," suggested Bova. "But philosophically, I think that we have been alone for a long time and it might be nice to have a friend — a partner — or even an adversary. A worthy adversary which would sharpen our wits, and force us to do better. It might bring out the beast or the best in us."

---

*Millenium, by Ben Bova. 288 pp. 90p. Orbit paperback, published by Futura.

**The Duelling Machine, by Ben Bova. 256 pp. $1.95. Ace Books, 360 Park Avenue South, New York, 10010 USA.

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31st October	Grand Hotel, Bristol Marlborough Suite	10.30-12.30
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1st November	Barnston Hotel, Edinburgh	10.30-12.30
2nd November	Aerodrome Hotel, Croydon Concorde Room	10.30-12.30
2nd-3rd November	The Post House, Thornaby (In conjunction with Tektronix Exhibition)	11.00-1.00
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OP SPOT

By Bernard Allen

HINT OF THE WEEK

Physical unload, reload often isn't necessary

THE use of operator commands as a means of saving time and effort in the Burroughs MCP 2 environment is the theme of two hints sent by David Leigh, an operator at the Manchester site of CCL Systems.

The first relates to the loading of cassettes.

According to Leigh, when the system has finished writing to a cassette it carries out a software locking function so that the volume cannot be accessed. It confirms this by issuing the following message:

CSx LOCKED

But quite often a subsequent job will want to read the data just written, and to make this possible the operator has to go across to the unit and physically unload and reload. Dave Leigh has a better method:

"Rather than doing this, make use of the SAVE and READY commands." Effectively, these offline and online the volume.

He gives the following example:

SV CSx
RY CSx

He continues, "You don't need to physically write-protect the cassette (until the time comes to remove it from the unit) as the MCP 2 system should carry out a software function to that effect. However, great care must be taken if any cassette-initialising jobs are to be run."

The second hint concerns deferring the printing of listings.

He says, "If you wish to stop the printer, rather than walking over to it and pressing the 'off' button, make use of the aforementioned commands." He again gives examples:

SV LPx

This command will stop printer x, and cause output to be routed to the back-up print facility, or spool.

RY LPx

This will have an effect opposite to that of the command just described.

Manager who holds his staff in high esteem

AS Barry Johnson sits at his desk, on the corner of which stands a wooden carving of a hand giving a victory salute ("I got it at Woolworths, but everyone thinks I must have bought it on holiday abroad"), he looks too young to be an operations manager.

But he fills that position with considerable flair and success at the West London benchmark centre of Univac, which I visited and described last week in Op Spot.

And when I talked to him it soon became clear that he holds his staff in high esteem and has a keen interest in the operations scene in general.

One issue for which he feels concern is the relationship between trade unions and operations staff. As he explained, "I had quite a difficult situation to sort out in April of 1976 when my operations became involved with ASTMS."

Barry Johnson

He had been away from the site for a while and, during that time, a disagreement arose between the company and the operators over their contracts of employment. Apparently, one of the operators got in touch with the union.

He continued, "When I came back twenty of my operators wanted to join ASTMS but the other three did not.

"I made it clear that I thought they should all join ASTMS or all stay out of it. After we cleared up the misunderstanding over the contracts, they all decided not to join."

Johnson then went on to mention some of the difficulties his operators occasionally face when they go to the sites of users in order to provide technical support and staff training.

"The unions sometimes stand in the way of operators improving their knowledge of the system on which they work. When members of my team go to user sites in the UK, the operators there are sometimes reluctant to delve into hardware matters in any great depth as they consider it to be engineers' work.

"Now that's as it may be. But the point I am making is that by becoming involved in that way, the operators will do much to improve their knowledge of the system. Union involvement often has the effect of discouraging this."

However, he does not discount the fact that unions can do much for operations sta stresses that they must go it in the right way to b positive influence.

He added that "there mig a place for an operators' u

Yet he believes that it i responsibility of the opera manager to ensure that st the correct training and ficient career opportuniti pointed out that if this is there is no need for the op tors to become too involved unions.

Describing the staff stru and review process used a site, he continued: "We d have trainees as such, and stead take on experie operators at our Op 1 grade instance, at the moment I looking to recruit two per with up to 18 months perience. We will then t them in all aspects of the systems."

The next grade is Op 2 a comprises staff with opera experience from 18 month three years.

Qualifying the amount of perience required of the st continued: "My staff have of a very high standard be when they become involved post-sales work and visit sites of users, they have to completely on their own."

According to Johnson, s reviews should be carried ou a regular basis, so that th operator concerned is kept u date on his progress.

South Africa not so different from UK

"WITHOUT denigrating the role or status of the applications system design and programming department, it is high time that proper recognition was afforded to the operations department and those employed there."

Such is the view of operations consultant John Willsher who, in an article published in the South African journal Computerweek, brings to our attention the fact that operations staff in that part of the world face problems similar to those sometimes encountered by their counterparts in the UK.

In his opinion, there are two broad areas which need greater consideration if progress is to be made.

"These are the underestimation of the consequence of an efficient and cost-effective operations department; and the lack of visible talent at all levels of operations staff, particularly and most evidently at the managerial level," he says.

According to Willsher, too few of the South African computing fraternity *realise* what op *tions is all about.* He conti *"Unfortunately many,* par *larly those who should* k *better, confuse operations* operating."

He defines operations a service department" and goe to describe the requirements role of the staff.

"The department is, or sh be, manned by specialist work flow control techni quality control, data prepar methods, operating for ma mum throughput, sec operating system fault d nosis, tuning and maintenan

Therefore, operations carry far more respons than "run of the mill prog mers," and if they are not rying out their function pr the whole concern will su

According to Willshe trend towards more and online and real time system added to the dependen operations, and a low service often means productivity and sal

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MICRO-BASED GAMES AND CALCULATORS

The most visible impact of microprocessors has been in the development of a new "electronic consumables" industry, including games and calculators, watches and washing machines.

The micro has turned the calculator from a clumsy and expensive instrument into a handy, low-cost device that is now beginning to spread beyond the limits of mere calculation into areas such as teaching aids for languages, translation and spelling.

The electronic games market started with the video games that sprang up in pubs, but is now beginning to encompass more traditional games like dear old battleships.

This supplement takes a look at the development and at the potential of calculators as seen by Chris Evans, talking to Robin Webster, who edited this supplement; while David Letheren, of General Instrument Microelectronics, gives a background to the electronic games market.

Then Robin Webster provides a round-up of some of the new products on the market which could go on Christmas shopping lists.

Calculators will 'converse' with the users

Dr Chris Evans holds Muppet, which, developed at the National Physical Laboratory by a team under his direction, heralds a new age for calculators. Advances such as voice input/output, flat screens providing a graphics display capability and enormous amounts of data storage on a single chip may be seen over the next two decades and this will totally alter the current conception of what a calculator can do.

WHEN Blaise Pascal invented the first mechanical calculator about 1640, accountants of that time were struck with the fear that his gear driven device would replace their manual calculation skills, so highlighting its obvious numerical potential.

But the whole calculator world has been changed by the introduction of microprocessor techniques, so much in fact that, according to Dr Christopher Evans, psychologist and computer scientist *"In the future, I don't believe anyone will just buy a calculator which only does numbers, any more than one would buy a computer now which couldn't handle words."*

Such a comment puts a whole new perspective on the role the calculator may play in society. *No longer will a calculator just calculate digits and come back with a numerical answer, but instead multi-function devices that can "converse" with the user verbally and accept vocal commands will soon evolve.*

"I think we are seeing the kind of conceptual change that took place with computers about 20 years ago," said Dr Evans. "This was when people realised that computers weren't important only in relation to numbers.

"Of course they were invented and brought into being in order to play with digits and tot up huge sums of money very quickly, and it was quite natural that people got fixated on that notion. But once you realise that even a computer doesn't actually deal in numbers — it deals with binary states, which are then subsequently converted into numbers — then you don't have to stick with numbers.

"You can use letters, and therefore words, but it actually took some time before that idea got through, mainly because the thrust of that work was to do with number crunching.

"Now, you might draw the parallel that many of the calculators of today are really rough equivalents of the first big computers. There is no essential difference between them; all that has happened is that the components have shrunk down."

Recent developments such as the electronic memo pad produced by Toshiba that can store telephone numbers and similar brief information, and Cy Endfield's hand-held word processor (CW, May 11), have impressed Evans, but he dates the realisation that calculators could be really important devices from the time that Casio introduced its CQ-1 calculator/clock.

"The CQ-1 showed me that my earlier thoughts about producing an interactive handheld calculator were on the right track," he said. This has now been developed at the National Physical Laboratory and given the code name Muppet (CW, July 27).

"Muppet seems to me to be just the first in what will be a very long line of multi-purpose pocket computers, of which the numerical computing function will be but a small aspect," explained Dr Evans. "Future versions presumably will have some calculator functions, maybe even Mark 2 or 3 Muppets — why not, it's easy enough to do that."

Early test programs on Muppet have centred around language translation, not because it has been developed especially for this field, but more as a demonstration of its capabilities and versatility.

"Chris Goss, who programmed Muppet, developed a simple language translation program merely because that was an application we knew people could understand. I have found that people don't always get the point of what you are doing even if that point is a fairly dramatic one. Sometimes the message has to be made very clear and I thought that there was something everyone could comprehend quickly in the notion of machine translation. That was the only reason we picked it.

"It's interesting that, even then, people have written in saying that they have patents out on a machine translator, or something like that, clearly failing to understand that Muppet is not tied to machine translation or anything else for that matter. It depends on how you program it."

In addition to the one-for-one word translation function, Muppet is currently able to run an interactive French vocabulary test, suggesting the enormous potential for the use of similar systems in education.

"Of course these things will become very cheap to buy, once they are produced by the billion," said Dr Evans. "Every person will have one. It may be rather like having asked the question 'Will everyone have a book?' around the time printing was invented.

"Similarly, I think that people will have lots of these Muppet-like devices. You may not necessarily want to carry them around with you, they may instead be all over the place, like pencils. The pencil is probably a better example than the book.

"But one of the striking features of the 80s and 90s will be a tremendous assault on world ignorance, because Muppet-type devices of the future will do the teaching where teaching is not possible at the moment.

"My guess, and it is the line I am taking in my latest book Evolving Superbrains*, is that the 90s will be a decade when the Third World itself will be transformed by computers."

By that time, Evans says, there will be millions, if not billions of multi-function pocket computers in production.

"It is so easy to do, and the things will be so useful. Most important of all though, is that there is an awful lot of money to be made out of them; people will want to buy this sort of thing."

But wasn't there a barrier to be removed before such a scenario could take place? Did people still fear computers?

Evans dismissed this argument. "I don't believe that there is really a barrier between people and computers," he said. "It is more a media creation — a barrier of ignorance, if anything. Most people don't understand what is going on."

However, the situation was not insurmountable, as he believed that the generations growing up with computers in the classroom would accept the situation more freely. And even governments would have little power to stop the advance of such technology.

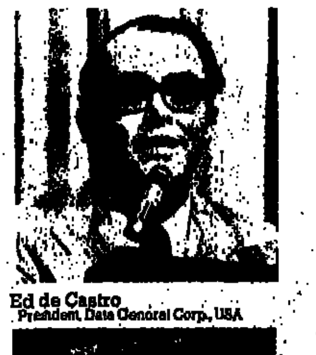
"You have to accept any technology," said Dr Evans. "The world is basically at the mercy of the technology it creates. There is very little that one can do about it. Try legislating against motor cars for example, or sewing machines. It is virtually pointless.

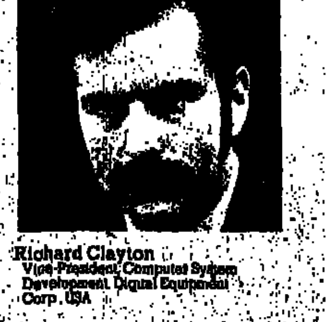
"And equally, calculators have swept through the school system while people are still standing around asking whether they are a good thing or not. I think it is very important, however, that since we have a bit of time for foresight, we ought to start looking at what is the best way to use these things before they are made by the billion and sold without any proper research into whether the product being sold is a sensible one."

When asked to look 20 to 30 years ahead, Evans remarked, "I don't think you can look that far ahead with any real certainty.

@ Turn to page 16

ese old calculators were doomed to obsolescence by their mechanical ature. The picture shows the Multivo produced in 1922 (bottom left), the odel introduced to the UK in 1913 (top left), the Chateau produced in 98 (top right), and the Millionaire, first produced in 1893 (bottom right).





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Future of the electronic games market

By David Letheren

Before 1976 the total market for electronic video games was no more than 300,000 units, the majority of these being coin-operated systems used in public houses or pinball arcades. To date, over 25 million game microcircuits have been manufactured throughout the world.

One of the companies in the forefront of the games microcircuit market is General Instrument Microelectronics. It is part of the American General Instrument Corporation, whose products range from electronic components to microcircuits and the computer hardware used by off-track betting organisations in the US.

In this article, David Letheren, product manager, consumer products for GIM, takes a look at the development of electronic games.

FROM the early single chip video game units, developments have been made which now make it possible to purchase complex programmable game systems, on the one hand, and electronic toys on the other. Figure 1 shows the predicted market for electronic systems in games and toys for the current year, and it can be seen that the dedicated, single chip systems account *for some 70% of units.*

Less than 10% of electronic games and toys are at present ROM programmable systems based on multichip microprocessors, although this area will grow rapidly with moves towards incorporating the teletext and viewdata information systems into the games unit.

Like the first single chip calculator, the early video game circuits allowed manufacturers for the first time to assemble a finished product from just a handful of components, at a retail price within the reach of *the average household. Battery* operation allowed easy connection to the television set, and the variety of skill games offered made them attractive to the home buyer.

Second generation models introduced the joystick controller to the bat-and-ball games for added realism and skill requirement, and now other popular arcade games are appearing in the shops for use in the home.

One very exciting example is the Tank Battle in which players manoeuvre a tank through a mine and obstacle strewn battlefield using authentic tank *controls, with the mission to* shell the opposition while taking necessary avoiding action. Not only does the player have complete control over the tank, he can also steer the shells, which demands a high standard of dexterity.

As this sector of the market has grown, an increasing proportion of the total has been taken by the volume electronic equipment manufacturers, in the Far East, with many European manufacturers moving into the more complex programmable systems. Such systems divide into lower-priced *extendable units with no* standard microprocessor, and very versatile units designed around a microprocessor chip set.

Once the buyer of a dedicated chip system has become familiar with the available game variations he will often wish to acquire a further unit which offers a different set of games, and it was to satisfy this demand that programmable systems came on to the market. By exchanging cartridges in a basic console it becomes possible to present many games of different types, the cost of each additional cartridge being relatively low.

This approach is particularly interesting to the television set manufacturers, who see this as a means of integrating a games unit into the television set which will maintain interest over the full life of the set.

At the inexpensive end of the programmable systems are the extendable games, where the console contains the game controls, power unit, and basic electronics to interface to the television set, while the plug-in cartridge contains a dedicated game chip mounted on a printed circuit card with a standard interface layout. With different cartridges it is possible to play games of bat-and-ball, battle, road racing, rifle shooting and many other types which are essentially exercising the player's ability to control shapes on the screen.

However, when a full microprocessor chip set is incorporated into the console then the variety and complexity of uses for the system are immediately expanded, and already a market for these more expensive games is beginning to emerge alongside that for simpler systems. Action games become more realistic, a typical example currently available being a moon-landing challenge, where thrust to the rocket motor is player controlled to try for a soft landing, while the microprocessor computes the effects of gravity and the quantity of fuel available.

Another interesting example is a golf game where the direction and swing of the club are under control and are selected to play each hole in the minimum number of shots, starting with a drive off the tee through to putting on the green.

Using the interactive nature of these systems several games of chance have been successful, particularly those based upon playing-cards (like blackjack) and poker dice, although now some advanced chess competition and code breaking cartridges are about to be launched.

In all the microprocessor games described above the cartridge consists of a ROM programmed with the rules for each particular activity, usually some 20K bits of data. An exciting future trend will be the move to magnetic cassettes, where data is stored on standard audio tape and transmitted into RAM from a cassette player.

Not only does this have the advantage of making any program available to the public far faster than an equivalent ROM but the quantity of data available is now raised to over 2 million bits on a standard C60 cassette, thus enabling educational programs to be prepared.

A simple arithmetic package, for example, in conjunction with a calculator keyboard could set a child to arithmetic problems, instruct him to try again in the event of a wrong answer, and offer graphical explanations should he fail.

A second tape could input the rules for a scientific calculator with the TV offering a large display, with the very real advantage over conventional calculators of being able to display the entire sequence of calculation.

With a full alphanumeric capability, tapes for any learning programme can be written, also instructions for cooking recipes, home medical and first-aid treatments, train timetables and a host of similar titles.

Obviously the applications for such systems are limitless and [illegible] is a *very small development* [illegible] the *home computer*, where the need is not only to read the tape but also to store and update information on tapes prepared by the user.

Although it is the field of television games that has made popular the use of electronics in home leisure systems, that area of Figure 1 representing hand-held games is probably the fastest growing segment of the whole electronic games market.

Very popular in America, and soon to be sold in Europe, are calculator-size units with LED displays and suitable controls to play games of football, or car racing, or at a more intelligent level, code deduction. One variety of this allows the player to make successive attempts

● Continued on page 15

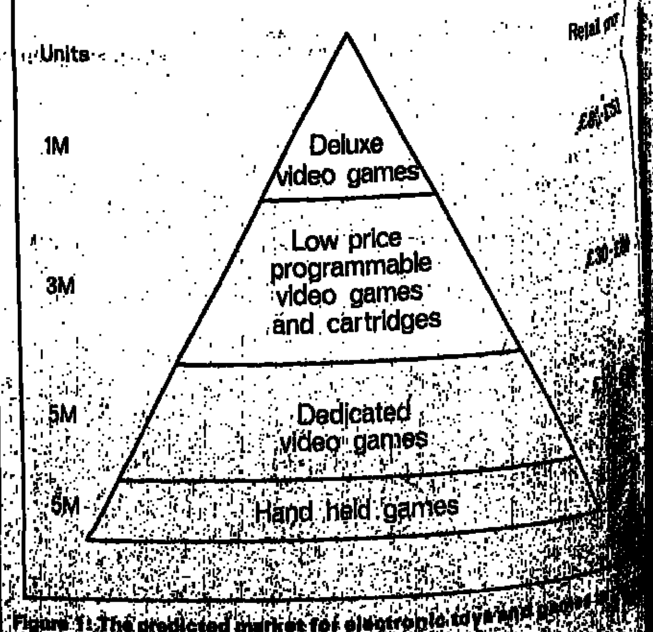

Figure 1: The predicted market for electronic toys and games in this year

Magnetic Media Manufacturing Division

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Control Data is pleased to announce to the OEM market that it's highly successful 9380 series of band printers is available from its United Kingdom manufacturing subsidiary located at Stevenage, Herts.

These printers utilise the latest band technology to achieve speeds of 300, 600 and 900 l.p.m. with a 64 character print set and incorporate features that provide for a high degree of spares commonality and easy interchangeability of character styles. Also available are 48, 96 and 128 character print sets.

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We are holding a number of open days at our factory in Stevenage to introduce this product family. We would like to extend an invitation to you to join us when you will be able to see the product in its manufacturing environment and to discuss the product and its application to meet your requirements.

An Invitation to U.K. OEM Suppliers

To join us on one of our open days being held, two sessions per day—morning and afternoon—at our factory in Stevenage on 24th, 25th and 26th October, and to be our guest for lunch.

Please contact us for your official invitation.

A major innovation—the use of an engraved 'featherweight' steel print band instead of a drum; operator interchangeable within approximately 30 seconds.

CONTROL DATA

To receive an invitation please contact Colin Keighley, OEM Sales Department, Control Data Ltd., 22a St. James's Square, London, S.W.1. Tel: 01-930 7044, ext. 228

Ideas for the Christmas stocking

AS Christmas looms, the perennial problem of selecting gifts for family and friends arises. Many may find the solution lies in the new microprocessor-based games that have come on to the market recently and which show that the games market is still very much alive, while continuing innovations in calculators could introduce more electronic variety into the Christmas stocking.

The first impact on the consumer was made with the simple one or two game plug-in TV units which allowed you to turn a domestic television set into a football pitch or a tennis court.

This year's entrants are more sophisticated, with far more facilities available to the user.

Also, despite the fact that easy-to-use four function calculators can be bought for a few pounds from most shops, including some of the large supermarket chains, the market for multi-function and special calculators still prospers. Some of the latest products are described in this article.

These are not the only new games and calculators to appear, but rather a selection of what may prove to be the more popular.

One of the latest arrivals is Computer Battleships, an old favourite packaged in a new way.

Produced by MB Games, Computer Battleships is based on the TMS 1000 micro and consists of a console for two players which has plastic co-ordinate boards replacing the squared paper of schooldays. Each player has two boards: one for strategically placing ships; the *other for registering attempts, and if you are lucky, hits.*

Each opponent keys in the co-ordinates of his five ships with two slider switches provided, and with the GO/LOAD switch set to the LOAD position. This allows the co-ordinates to be stored in the microprocessor's memory. When all the co-ordinates have been keyed in, a WHOOP confirms that they were all entered correctly.

START OF A THREE-PAGE GUIDE TO SOME OF THE LATEST PRODUCTS ON THE MARKET

During all this, the sound of sonar waves is generated in an attempt to make the proceedings more authentic, and this sound continues throughout the game.

When both players are ready, the GO/LOAD switch is set to GO and battle can commence.

Attacking "enemy" ships is simple. All you do is set the two slider switches to the co-ordinates where you suspect a ship is placed and press both of them (when two tones will be heard) followed by the FIRE button. This results in a whistling sound like that of a shell being fired. If a direct hit is made (in other words if you select a co-ordinate where the micro has registered your opponent's ship, or part of it, to be) there is the sound of an explosion and a panel visible to both opponents lights up.

You can then place a red peg on your attack co-ordinate board in that location to give you clues to where the rest of the ship lies or where other vessels are. A white peg is used to signify a miss.

When all of one player's ships have been located and "destroyed", a WHOOP is emitted, signalling the end of the game.

Computer Battleships, available from Hamleys of Regent Street and Harrods in Knightsbridge, sells for £29.99.

For chess enthusiasts who have decided that their one to three level Chess Challengers are no longer worthy opponents, Spectrum Marketing of London has introduced the latest of the line, the Chess Challenger 10.

As its name suggests, the Chess Challenger 10 has ten levels of play ranging from beginner to expert. One of the levels available is specially suited for "correspondence" chess in which many hours can be taken to find the right move. At this level, the Chess Challenger 10 analyses over three million different board positions in 24 hours before coming up with a response.

It can be programmed to play opening defences from chess books and classic defences like French, Ruy Lopez, Sicilian, and Queen Gambit Declined can be handled.

An override key also allows the user to establish his or her own chess positions first and then allows the unit to respond.

Chess Challenger 10 is currently available exclusively from Harrods until October 16, when it will be available from selected stores. It costs £200.

A hand-held unit, Logic 5 is another micro-based product from MB Games, which falls into the category of a "numbers game".

The object of the game is to discover a number that has been randomly generated and stored in the game's memory. It can be of three, four or five digits, depending on how hard you want to make it.

No actual numbers are ever displayed, only red lights to signify if the number you keyed in was made up of the right numbers and what sequence they are in.

With two players, the first to discover the number is the winner. Logic 5 indicates that the number has been correctly identified by flashing all the display lights at once.

It costs £18.95 from Hamleys of Regent Street, and is also available through other games outlets.

Logic 5
number
sequence
S
R

Logic Five, from MB Games, is a new computer numbers game for a single player, whose object is to discover a 3, 4, 5 figure number picked by the computer.

In their spare moments, two members of the Computer Weekly editorial staff, Martin Banks (left) and Don Mitchell get to grips with Computer Battleships, a game based on the Texas TMS 1000 micro. It consists of a console for two players. Each has two boards — one for strategically placing ships, and the other for registering attempts — and, if lucky, hits.

Future of electronic games

● From page 14

discovering the four-digit code selected on command by the internal microprocessor but not displayed until chosen correctly, or interrogated when in frustration the player concedes.

Toy-makers are also beginning to utilise electronics in model railway or racing car controllers, and in sound generation for battle toys, but with such a vast potential we shall increasingly see electronic versions of existing toys, and even totally new ones.

As a summary to the market situation we can say that as the price of dedicated, single chip games reduces, these games will be produced more and more by the Far East manufacturers, whereas in Europe manufacturers will concentrate on more sophisticated programmable systems. This includes the television set manufacturers, who will incorporate cartridge game units in the set, and may well use the microprocessor as the basic circuit for the teletext and viewdata systems, and even tuning and program selection control.

Although tailing behind the game manufacturers in using consumer electronic microcircuits, there is evidence that toy companies are about to redress the situation, and with the very large number of such companies in Europe this will become a significant outlet for the microcircuits of those semiconductor suppliers operating throughout this area.

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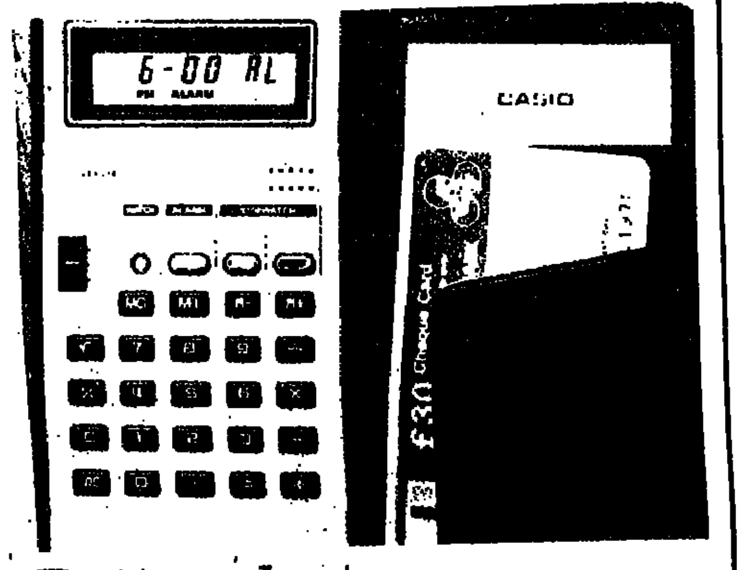


Battery lasts a year

DISPENSING with the problem of where to put the on/off switch on its AQ-1000 watch/calculator, Casio has not supplied one, but claims that power consumption is so low on the unit that it should be at least a year between battery changes.

Ordinarily, it functions as a quartz-controlled digital watch, displaying hours, minutes and seconds with an AM or PM tag.

It can sound an alarm at any pre-set time, and a visual signal shows that an alarm time is set.

The AQ-1000 can also be used as a stopwatch, to measure start/stop, time-out lap or first/second place times.

In calculator mode, it has an eight-digit display that can handle square root and percent functions in addition to the normal add, subtract, multiply and divide capabilities. Recommended retail price is £26.95.

Now you can compete against the TV sport

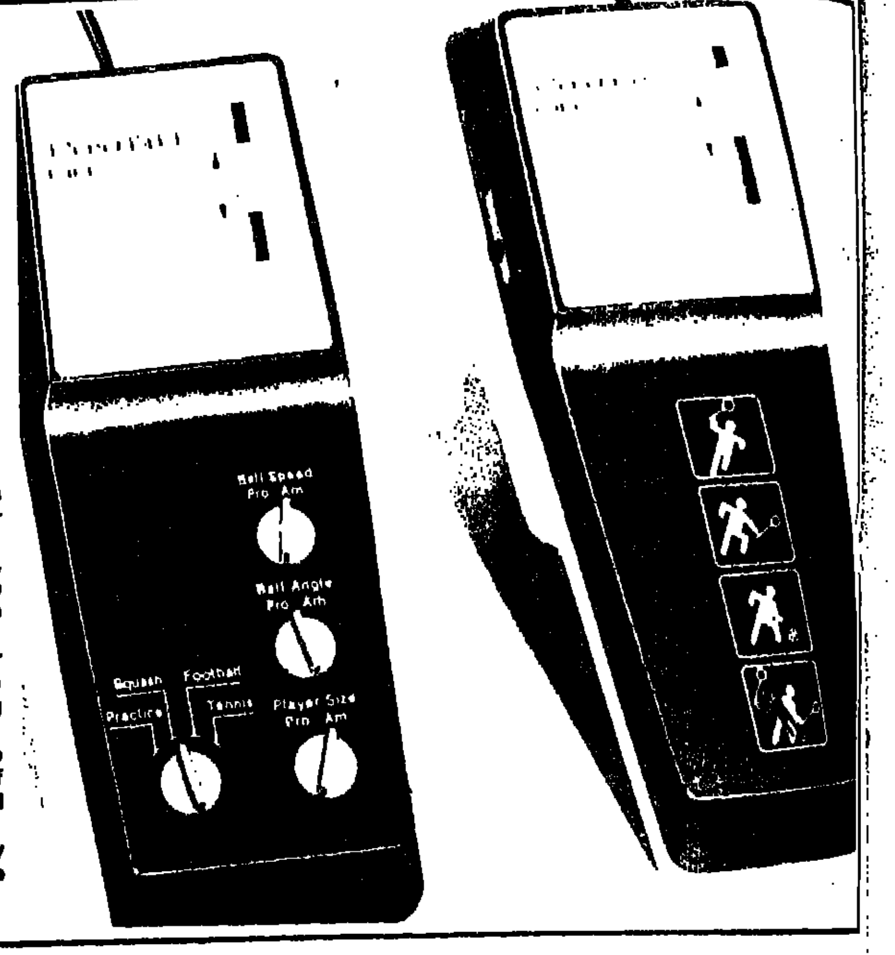
THIS Prinztronic Tournament Mini from Dixons is a four game black and white games unit based on the GI-8500 microprocessor and it costs £9.95.

The games available are football, tennis, squash, and squash practice in which one player can compete against the TV game itself.

There is a choice of bat size — amateur or professional — and "spin" can be given to the ball as it travels across the screen. Scoring is automatically updated on the screen.

All the circuitry is contained in the two hand-held control units, and the sounds of serve, bounce and the ball being hit are all generated.

The game operates off a 9 volts battery supply or with Dixon's universal TV game adaptor.



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Because DP is a service function, it depends on its users for ultimate success. But users from the Board to the shop floor differ in needs and outlooks and as they grow in power and numbers their attitudes can make or break the fortunes of DP.

This practical workshop, to be run by Nigel Laurie of Communications Audit, will help delegates to discover the techniques and approaches that work best in helping successful user relations. The workshop is practical and based on experience. Above all it is participative so that delegates can put theory into practice. A summary of a survey conducted at a previous Nigel Laurie workshop on this subject was published in Computer Weekly on May 25.

For this latest workshop the number of participants will be limited in order that the maximum benefit may be achieved. If you would like to reserve a place please complete the application form and return it to the address shown, not to Computer Weekly or the IDPM. A brochure giving further information about the workshop may be had from Tony Swain, BIT, 40 Bowling Green Lane, London EC1 0NE.
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Please reserve.........places for the Successful User Relations Workshop to be held at the Holiday Inn, George Street, London on Tuesday, October 17, 1978. The fee is £50 (plus VAT £4); for members of the IDPM it is £45 (plus VAT £3.60). This covers attendance at the workshop, coffee, lunch and tea and full course documentation.

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Are you a member of the IDPM?

Instant replay offered by Texas

A BUILT-IN instant replay facility which allows the user to check back on the last 20 entries, and make corrections if necessary without re-entering the entire problem, is available on the TI2550-IV calculator introduced by Texas Instruments.

A general-purpose hand-held calculator, it features the normal addition, subtraction, multiplication and division functions, together with a percentage key.

The TI2550-IV has an eight-digit vacuum fluorescent display, with a floating decimal point, negative sign, and overflow error indication.

The replay facility is activated by pressing the back step key. Replay can be stopped at any point and corrections made by keying in the new entry and pressing the "equals" key.

It is priced at £29.95.

'Conversing' calculators

● From page 13.

There are so many variables involved.

"You used to be able to write books about the next 100 years, and I have one in which the author, writing in 1930, looks at the year 2030. It's amazing — he actually believed that aeroplanes would get up to 300 mph by 2030, but he didn't think there would be any transatlantic flights unless they could land on platforms along the way!"

Despite the possibility of unpredictable developments, Evans did comment on some likely events.

"Certainly, there will be voice-addressable calculators which will be very small. I have looked at the development of the wristwatch with great interest. I am sure it will gradually acquire more and more functions of the computer. The key to this will be that you will need a voice recognition system in it because there will be no space for buttons. There will also be voice output. Incidentally, the problem here is the power supply, as more power is needed to operate the think when speech capabilities are incorporated.

"We are moving into a phase where a lot of effort and research will be pooled into developing cheap and long-lasting power packs."

What storage would these units have? Might they need to communicate with larger machines for really complicated processing tasks?

"It all depends on how rapidly mass memory technology advances. Now you can never say there may be some upper limit to what you can get on a chip, but at the moment it looks almost certain that we will get as far as 1 Mbyte on a chip. That's not more than drawing board stuff at present but we will get it eventually.

"Now a Megabyte is a tremendous amount of storage capacity," continued Dr Evans "but if it stopped at a Megabyte then it probably wouldn't give you all the storage you wanted. I guess it will go beyond that level, quite frankly, because we are dealing with things of electron dimensions and I don't see why, in principle, you ought not to get that far down. Then we would have tremendous memory sizes, something like 1,000 Mbytes.

"If this sort of thing is to happen, then I don't see the need to have access to larger databases. The only thing you might want to access is something for up-to-date news. Also, presumably with all this capability, calculators of the future will be intelligent enough for you to [illegible] conversation ... it will be like having a brilliant dwarf [illegible] your watch."

Displays, too, would [illegible] for review. "We may [illegible] these wristwatch calculators will incorporate graphic displays. This is impossible at present because of the [illegible] cathode ray tube [illegible]. They would be too [illegible] useful displays will [illegible] though, when flat [illegible] which have been under development for a long [illegible] introduced.

"Then calculators will be [illegible] to carry graphic displays [illegible] these devices will initially be sold for their game capability [illegible] that you can play all the [illegible] that you can presently play [illegible] your domestic television set.

"In fact, the wristwatch unit may be too small to be of any use, and maybe only pocket-sized calculators [illegible] have these screens [illegible]

• Evolving Superbrain [illegible] Man's Brief [illegible] puters, by Dr Christopher Evans [illegible] be published [illegible] year.

10 action games for under £30

THE Prinztronic Tournament Ten from Dixons provides the user with ten action games for £29.90.

These include the "usuals" such as football, tennis, and hockey, and the more unusual: gridball, basketball and basketball practice, target practice and squash practice.

Control of the selectable size bats is by joysticks that provide players with full horizontal and vertical movement across the field.

The Tournament Ten is based on the GI-8610 chip and runs off a 9 volt power supply or with a Dixons Universal TV game adaptor.

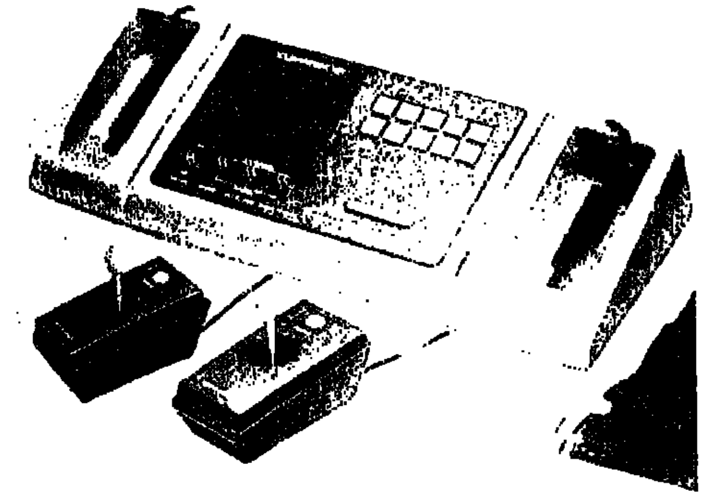
Two other models in the Dixons range are the Prinztronic Tournament Colour Programmable 2000 and 5000.

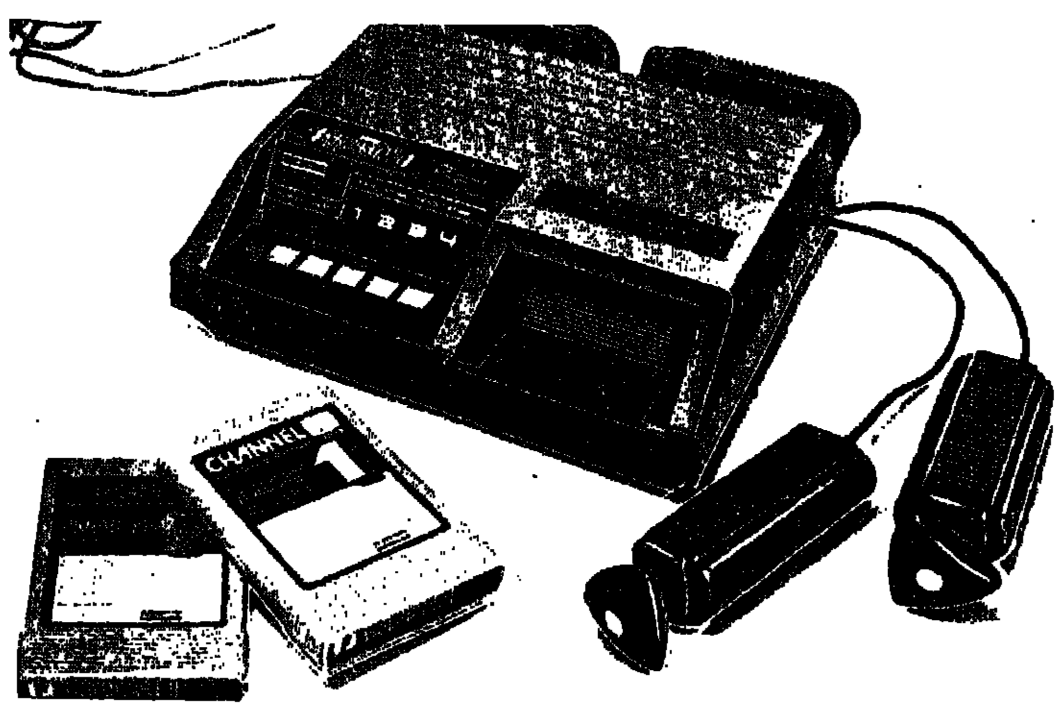
These sell for £44.95 and £39.95 respectively and are cartridge systems similar to the Fairchild unit.

On the 2000, the Road Race cartridge features two driving games, and has simulated engine sounds, lifelike car crash sounds and a speed increase every two seconds with up to seven speed changes.

On the 5000, the Convoy cartridge stages realistic sea battles and includes sonar sounds, destroyers travelling twice as fast as submarines, visible explosions and explosion sounds.

Dixons says that further cartridges will be added to the range, enhancing the systems.


The Prinztronic Tournament Ten.



Matching sounds in Grandstand

ANNOUNCING its new TV games, Dixons has the Fairchild Grandstand Microprocessor TV game at the top of its range.

This unit is an example of an extendable game. It comprises a basic processing unit and plug-in cartridges which hold many different games programs in ROM.

It is a full colour unit, and can generate sounds to match the games available. These include Blackjack, Space War, Backgammon, Drag Race, Maze, Baseball and Maths Quiz and Maths Quiz Two.

There is a total of 15 cartridges, and each costs £12.95.

The unit comes complete with a bat and ball game cartridge and it fits most UHF television sets. Dixons sells it for £129.95 and it is also available through DG Leisure Centres.

Long-lasting memories

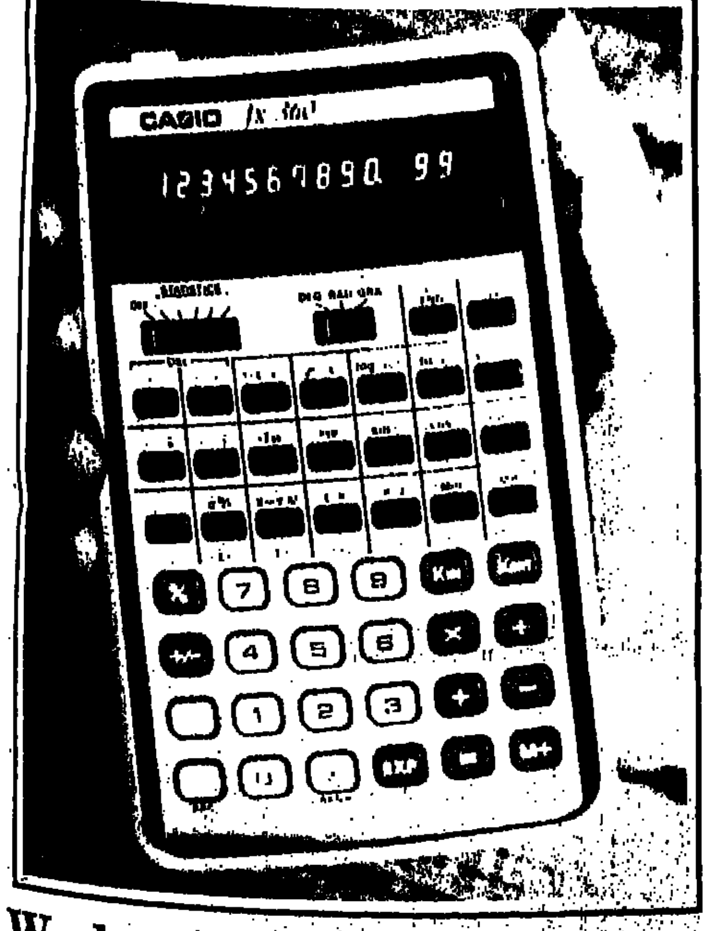
AMONG the latest Casio scientific calculators is the FX-360 which has seven non-volatile memories powered by *separate long-lasting* batteries *that hold stored figures* when *power is switched off* for up to weeks at a time, and even when exhausted main cells are being replaced.

The FX-360 has a 12-digit display and among its 59 functions are linear regression, standard deviations, and exponential curves. The usual logarithmic, trig and hyperbolic functions are provided, as are permutations/combinations, rectangular/polar conversion and factorials.

It can also handle eight-level parentheses.

There is an independent accumulating memory and six constant memories.

The FX-360 costs £59.95.



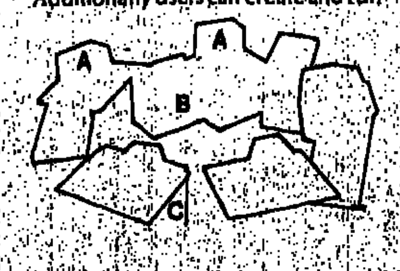
Wedge-shaped device from Toshiba

SAID to be more convenient for hand or desk use, a new wedge-shaped calculator has been introduced by Toshiba.

Called the Toshiba LC-8000 the calculator has nine-digit liquid crystal display and costs £12.95.

Functions available are floating decimal point, automatic constant factor, square root, plus/minus signs and percentage keys. It has a four-key independent memory.

It weighs 3.5 oz and measures 2.6 x 4.3 x 0.4 inches. Its batteries are said to last about 1,000 hours.



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B. DISK/TAPEPROCESSOR – dedicated to ensuring optimum use of disk/tape channels. It responds to, and quickly services, disk commands from all other processors in the system. Disk capacity can be increased to 100 Mb for on-line storage of data batches, system files, entry and validation formats and user-programs.

C. DATA ENTRY KEYSTATION PROCESSORS – there can be four of these, each supporting eight (520 character) Keystations on one system.

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Two Northern firsts for ICL

TWO 2900 firsts are claimed by ICL. North Yorkshire County Council has installed a 2976 at Northallerton, said to be the first such machine for a local authority, and in Lancashire, Rochdale Metropolitan Borough has become the first 2960 local authority in the north-west.

The Yorkshire machine, a four Mbyte system costing over £2 million with 16 200 Mbyte disc drives, replaces a large 1904S. It will run under VME/B.

To prepare for the 2976, the BOC Datasolve service bureau was used for conversion work and to set up transaction programming systems. In addition to its own work North Yorkshire will provide services to four neighbouring district councils using 7503 terminal systems.

At Rochdale, the 768K 2960 costing about £750,000, is running under ICL's direct machine environment while it takes on the workload of the present 1902A. This machine is due to be phased out in about a month.

COM enhancements

A HIGH density magnetic tape subsystem and a cartridge disc drive with a capacity of up to 12 Megabytes have been introduced by Datagraphix as enhancements to its System 4500 and Autocom computer output microfilm systems.

The tape system can have up to four transports, each recording data at 1600 or 6250bpi, with 2-track error correction at 6250bpi and multiple track error correction at 1600bpi.

The disc drive has two discs, one fixed and the other removable. The latter can have a capacity of three or six Megabytes.

NEWS IN BRIEF

$5m order for terminals

SPECIALLY designed video display terminals worth over $5 million have been ordered by small business systems manufacturer Kienzle of West Germany from Beehive International of Salt Lake City.

The displays will be used with Kienzle's transaction processing business computer, the 9066, which is built around the Texas Instruments TI 990 minicomputer.

Up again

THE second quarter of 1978 sales of $18.4 million have given American Microsystems net earnings of $840,000 for its seventh consecutive quarter of profit growth. This quarter saw heavy start-up costs for VMOS memories but the net earnings figure was still more than double last year's equivalent from a similar sales total of $18.1 million.

Itel advance

ENHANCING its Advanced System series of IBM-compatible machines near the top end, Itel has introduced the AS/5 Model 7031 Attached Processor which can improve the performance of the existing AS/5 Model 3-7031 by up to 1.8 times. The 3-7031 itself is rated equal to or greater than the IBM 3031, according to Itel. No attached processor is available from IBM for the 3031 at the moment.

Stud Book DBMS

A PRIME 500 minicomputer, supporting between 20 and 25 terminals and running Prime's Codasyl-type DBMS, has been ordered by Weatherbys, *the* General Stud Book *Authority* for Great Britain *and* Ireland. The system, which includes three 300 Megabyte disc drives as well as the 750K-byte CPU, will be used in the administration of 6,000 horse races a year and will also keep records of over 300,000 thoroughbred horses and 30,000 owners, trainers and jockeys.

BC/7 user

ONE of the latest users of Univac's BC/7 small business system is Burton Reproductions of Ashford, which will use it to handle order processing, stock control, and sales and ledger applications. The BC/7 will replace a manual accounting system and consists of a 64K processor, 10 Mbytes of disc storage, a work station, and one printer.

On the rates

TO handle their general rates, rents, accounting and payroll applications more efficiently, North West Leicestershire District Council and Harborough District Council have each decided to install UDS 2000 terminals to replace DCT 2000 units.

Programs for micros on 21 cassettes

US personal computer magazine Creative Computing has released 120 programs for microcomputers on 21 cassettes or two floppy discs.

Drawn mainly from the books, Basic Computer Games and More Basic Computer Games, as well as from the magazine itself, the programs include logic and number games, word games, educational exercises and graphics.

The floppy discs, each containing 50 programs from Basic Computer Games, are recorded under the CP/M operating system for 8080 compatible machines, with Microsoft Basic, and sell in the US for $18.

The 21 cassettes, each containing an average of six programs, sell for $8 and come in versions to run on Pet, TRS 80, Apple II or Sol-20 microcomputers.

They will be available in the UK from LP Enterprises of Ilford for about £4 to £5 for a cassette and £12 for a floppy disc.

Court ruling may delay SBS service two years

From Cameron Davis in Washington

THE decision by the US Appeals Court to reject the Federal Communications Commission authorisation for Satellite Business Systems to enter the US domestic satellite communications market (CW, September 21) could cost SBS as much as a two year delay in starting such a service, if it is eventually authorised.

Ever since the FCC granted a carrier licence to SBS in January 1977, potential SBS competitors and other interested groups have challenged the wisdom of allowing a partnership between IBM and Comsat, to enter the common carrier industry. The third SBS partner is Aetna Life and Casualty Insurance company.

When the FCC agreed to the SBS application without a full set of public hearings into the expressed anti-trust concerns, law-suits were filed by the Justice Department, Western Union and American Satellite Corp.

Those suits were eventually consolidated into a single appeal to the circuit court in Washington.

In its recent ruling the Appeals Court said the FCC made an "illogical" determination in its decision that the public interest benefits afforded by SBS outweighed any potential anti-competitive concerns. The court ordered the Commission to repeal the SBS licence pending full hearings into the anti-trust issues.

"There is no evidence to support the FCC's findings that SBS would have a greater inclination to compete against AT&T than would IBM or Comsat alone," said the court.

In its 49-page ruling the court added, "The FCC must disapprove (SBS) unless no other alternative to approval would adequately, not just 'as adequately', serve the public interest."

The anti-trust threats posed by SBS, the court held, could be overridden, "only if the public would not otherwise receive reasonably adequate service from existing carriers or from those that might be licenced in lieu of SBS.

"It is not enough that SBS' service might be a little better than could otherwise be expected; it must be essential to a communications system sufficient to meet modern-day requirements."

An FCC spokesman said the required hearings could take from one to two years. Even then, he added, whatever decisions were reached could be appealed by the aggrieved parties.

The court's ruling drew mixed reactions from the communications industry. The biggest potential competitor to SBS, AT&T, agreed with the ruling: "We welcome the opportunity to take part in the hearings so that the issues involved may be resolved."

Some of the specialised common carriers, however, were disheartened at the decision. "It's a damn shame," remarked William McGowan, chairman of MCI Communications Corp. He said SBS would help, not hurt, competition, and that it would be of great benefit to business communications users.

By last June, the SBS partners had already invested more than $86.2 million on the venture that they project to cost more than $406.9 million by 1986.

A contract for about $63 million, by far the largest to date, was awarded last January to Hughes Aircraft for construction of three 12/14 GHz satellites.

At present, the FCC has not yet decided whether or not it would appeal the recent decision, a process which would in itself produce more delay. Meanwhile, SBS was hoping for the best, considering the sudden turn of events.

Solid state research in space

MORE details have been released about the potentially important semiconductor research work being carried out by the Russians in space (CWI, August 3).

The most recent experiment the two Cosmonauts completed was a joint Polish-Russian project to produce semiconductor material based on compounds of cadmium selenide, gallium arsenide, and indium antinomide. Other work has involved putting the Salyut 6 space station, into a gravitationally stabilised regime, during which all the engines of the spacecraft orientation system were switched off.

The long term importance of this work is that semiconductor crystals produced in zero gravity should display greater purity and better orientation, leading to the production of integrated circuits with considerably better performance than at present possible.

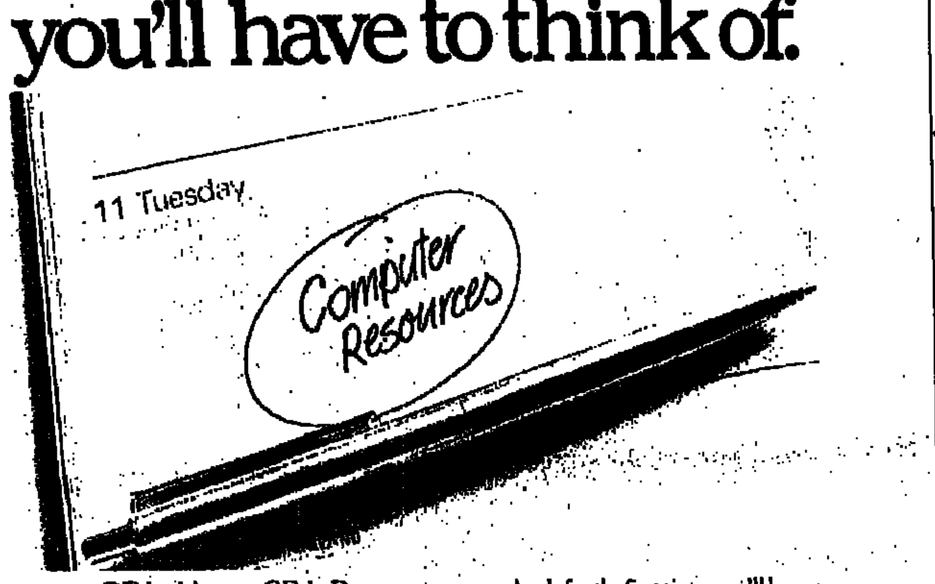
Though silicon based technologies such as MOS are still thought to have some 10 years development life left, IC manufacturers are already looking beyond that time, and indium antinomide in particular is already being considered as a successor to silicon.

CDC offers 635 Mbyte disc

A DISC subsystem with 635 Megabyte spindles — twice the capacity of the IBM 3350 spindles — has been introduced by Control Data. Called the CDC 33502, the system provides 1.27 billion bytes of storage in each of its two-spindle cabinets. Up to four strings, each with four cabinets, can be attached to a single control unit, providing a maximum capacity of 20.3 billion bytes. Control Data says that the increased storage capacity has been achieved by increasing the number of data surfaces and recording heads in each sealed data module and by packing a greater number of data tracks on each surface. CDC already sells a 317.5 Megabyte per spindle drive, the CDC 33801, which can be upgraded in the field to a 33502.

Redifon profits up

A TURNOVER of £11,500,000, 38% up on the previous year, has been announced by Redifon Computers for its 1977/78 financial year. Redifon's profits before tax of £1,699,000 were 19% higher than in 1976/77.



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MICRO NEWS

Edited by Martin Banks

256 Mbyte Electron Beam Accessed Memory by early '80s

THE prospect of a 256 Mbyte Electron Beam Accessed Memory (EBAM) system with an access time of less than 100 microseconds and 2K bytes read transfer times of 424 microseconds by the early 1980s was one of the many features of the conference programme held in conjunction with the Wescon exhibition, recently completed in Los Angeles.

Speaking at the conference session covering the Impact of New-Memory Technologies on Computer Design, Donald O. Smith, of Control Data Corp, described how in the near future, EBAMs could be providing capacities of 1 billion bits, and in the long term, even greater capacities of 1 billion bits and, in note, however, that development has not been as fast as predicted. In 1975, a 125,000 Mbyte memory was being postulated by the company (CW, December 18, 1975). It should have been available this year.

The EBAM, which is being developed from research work started in the 1960s, is constructed as a tube, rather like a CRT. At one end is an electron beam gun which fires a stream of electrons through a collimating lens and a beam steering system on to a target. This is constructed on a wafer of silicon, using an MOS process. The centre of the wafer is diffused as a square pattern of minute spots, each of which is built up of layers of P-channel silicon, N-channel silicon, silicon dioxide and a final metal layer.

The writing and reading of data through the charging or discharging of electrons which are stored in the silicon dioxide layer, is controlled by the combined action of the electron beam and pulsed bias fields applied across the oxide.

Four spots are used to make up one bit of information, and each target can contain between 16 and 32 million spots, each of which can be as small as 0.5 micrometres in diameter. Current theoretical maximum capacities therefore are in the 4 to 8 Mbits per tube region. There are, however, problems here in achieving such a capacity mainly due to the fact that the size of the deflected electron beam spot increases during reflection, and also that the required accuracy of the deflection electronics exceeds present technology.

But these problems have been overcome by using a double deflection style of tube, in which the beam is first steered by a coarse deflector to select one lenslet of an array of lenses containing a total of 1,024 lenslets. This array is followed by fine deflectors, in one-for-one correspondence with the lenslets. Here the final spot is in fact 1.2 micrometers in diameter. There are 128K bits in the field of each lenslet and fine deflector, thus giving a total capacity of 128 Mbits per tube.

The 256 Mbyte system will be constructed from 16 parallel tubes, which are known as the D3 type, together with the associated digital and analogue electronic control hardware.

The simplest use for the EBAM, according to Smith, will be as a disc replacement, as it offers the potential for nearly zero access time, high data rate operation. The main current drawback here is that software operating systems, where I/O is managed at the channel level, can easily mask the time savings in the time taken to process I/O requests. Move the I/O control to the CPU, however, and typical software overhead times can be reduced by a factor between 10 and 100.

Other applications seen by Smith for the EBAM include operating as an I/O cache memory for disc systems, as a staging memory in multi-level hierarchies, and as a direct extension of system main memory.

Smith's projections of future developments in EBAM technology include a dramatic increase in bit packing density from the current level of the D3 tube, which is around 10M bits per square centimetre, to a theoretical limit of around 10 billion bits per square centimetre.

It was also possible for him to predict considerable size reductions in tube packaging, leading to a tube with a capacity of 4 billion bits that measures just one in diameter and two inches in length.

Four prototyping stations

HERE are two of the possible four stations of the new DS990/AMPL family of microprocessor prototyping laboratories, which have just been introduced by Texas Instruments.

The new family provides the prototyping capability previously implemented on the TI FS990 diskette-based system. The prime additions with the new equipment are multistation operation and hard disc back-up.

The three systems in the family are all based on the DS990 computer hardware, and each includes a 128K byte memory, disc storage from 10 to 100 Mbytes, and up to four Model 911 display terminals.

Software for the system includes Pascal, operating under the DX10 operating system.

Development of a People's *Timeshare* System

A FASCINATING method of producing a "people's timeshare system" that ends up looking remarkably like a viewdata system, was one of the key papers at the Wescon session on "What's Happening to Personal Computers."

Given by Dr David Chung, vice-president of Umtech Inc, manufacturers of a home computer system called Videobrain, its contents centred largely on the development of the so-called "Chung Pyramid," a hierarchical configuration of microcomputer systems that together operate a "people's timeshare centre."

Although going about its internal operation in a different way, the type and scope of service involved closely resembles that of viewdata. However, Dr Chung, while acknowledging the existence of teletext broadcasting on British TV, failed to notice the arrival of the more complex interactive system which the UK Post Office is pioneering.

At the bottom of the hierarchy's pyramid would be incoming telephone lines. Each incoming call would monopolise a Level-O microcomputer, which would have a 16-bit CPU, 64K bytes of ROM and 32K bytes of RAM. It would also have one floppy disc for back-up store. The ROM would be used for holding the operating system and resident high level language firmware, while the floppy disc would hold a number of frequently used applications programs.

The aim of the system's selection algorithm would be to achieve the objective of getting a 70% probability that a user's need can be met by the Level-O machine.

A number of Level-O computers are connected to a Level-1 machine, which would use the same 16-bit processor, but would have only 32K bytes of ROM for its operating system. RAM would be in two halves, one retained for its own use, the other available to its Level-O computers as a buffer, thus supporting the data flow between levels.

With a dual floppy disc back-up holding both programs and data, the aim here would be to achieve an 85% probability of satisfying user needs from Level-0 and Level-1 combined.

The same relationship is continued up to Level-2 which would have much more disc storage capacity. The probability of satisfying user requirements by this level should rise to 95%.

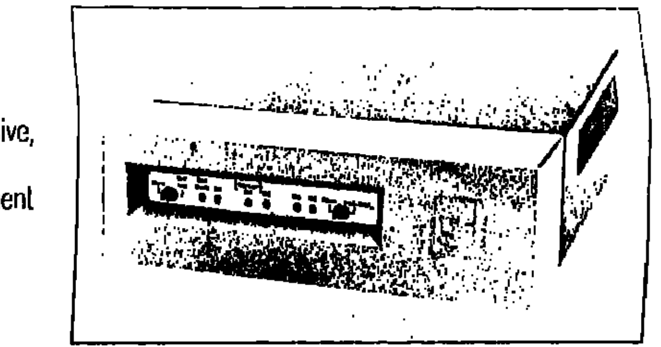
At the top sits a minicomputer that would have many resources, such as a large scale disc complex, printers and communications equipment. It would have the responsibility of taking information from a variety of sources, sorting and merging it, and switching down through the system to the necessary level. According to Chung, this requires a function that is the software equivalent of the virtual memory algorithm.

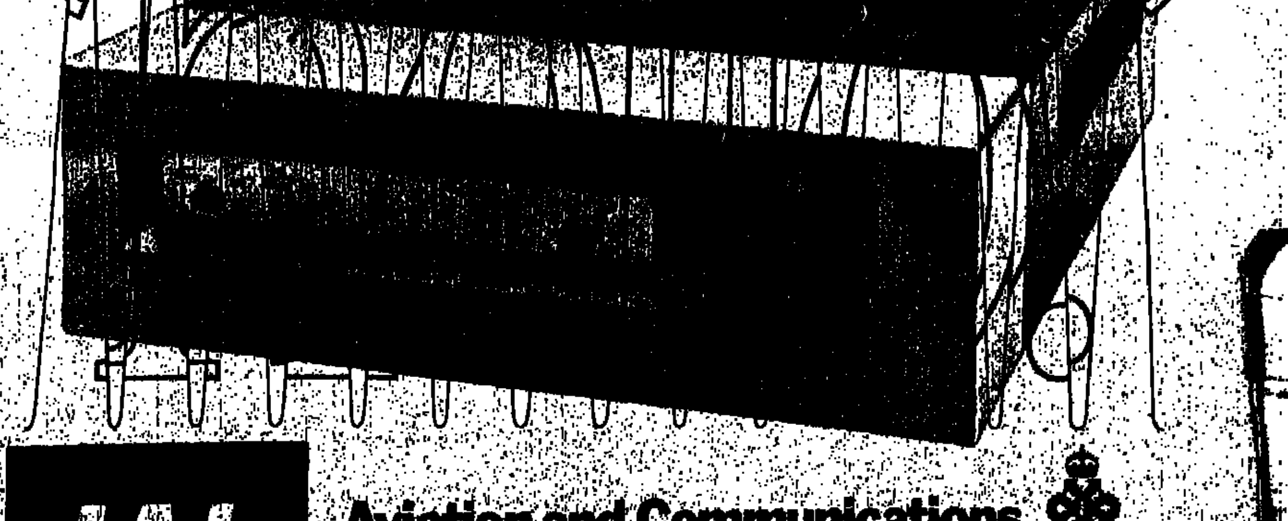
His estimates indicate that one top level computer can support up to 16 Level-2 machines, with the same relationship holding through the pyramid. Thus a full pyramid would consist of a total of 4369 computer systems, 4096 being Level-0 machines.

Volume PROM duplication

LOW-COST equipment for volume PROM duplication is now available from International Microsystems, which has introduced its IM2020 Gang PROM programmer. This has the capability to program up to 16 devices simultaneously and can currently be used with 2704, 2708, 2758, 2532, and both the Intel and Texas Instruments versions of the 2716.

It costs $2,895 and additional modules are $100.





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Computastars shine through wet, windy finals day

Report by Bernard Allen

CRYSTAL Palace Sports Stadium provided a grand, if rather wet and windy, setting for the final of Computastars, last Saturday, when teams from all over the country, plus two from Denmark, converged on South London and took part in a wide range of sporting events.

The spectators made a great impression upon the vast stadium, generating much enthusiasm and gave the athletes a lot of encouragement and support. They warmed to the long jump event; each time a competitor put in a good effort they burst into spontaneous applause.

The track events also drew great response from the crowd. Mike Hawtree of eventual winners of the Men's team title, Rowntree Mackintosh, enthused: "The atmosphere as we came off the final bend was tremendous. It gave me a real lift."

The Palace really did add to the occasion as Sheila Watson of Midland Bank, Sheffield, said: "It's a tremendous setting and an added incentive for everyone to do well."

As the day wore on, the programme got behind schedule and had to be modified.

As a result the final event — the Men's 800 metres, was run in fast-fading light. But it might have been a field of Steve Ovetts and Brendan Fosters, for as the bell sounded the last lap, the crowd got behind the runners, spurring them on to even greater efforts. And, as the athletes crossed the finishing line, cameras flashed in the dimness.

At the end of it all the Men's title was taken by Rowntree Mackintosh I, the team which qualified for the final after winning the North West heats, the first to be held; back in May. They scored 117½ points. Second with 104 points were Lambeth Borough Council, while Commercial Union was third on 96 points.

Number one seed of the Rowntree I team, system designer Martin Rigby ("The competition is a bit stiffer this time") took the Men's individual title with a total of 50% points. Second with 47¾ points, was David Beardsell, of Peterborough Data Processing, just a quarter of a point in front of Geoff Clarke of Lambeth Borough Council.

The Ladies team title was won by Scandinavian airline, SAS, which had entered teams in both Men's and Women's sections by special invitation. The girls scored 69 points, eight ahead of PMSL in second place, with Scicon Computer Services and Woolworths joint third with 56½ points.

Ladies Computastar title went to Gayle May of Case ("It's a bit too cold today") who chalked up 52 points, well ahead of Birte Andersen of SAS, who took the runner-up spot with 43¼. Sheila Watson, of Midland Bank, Sheffield, was third with 42½ points.

With a grand total of 570 PMSL won the Queen's Hotel Cup which was presented to the Men's and Women's teams from the same company who scored the highest aggregate score. Commercial Union was second with 475 and Scicon Computer Services third.

After the competition the trophies were presented in the stadium bar which was packed with spectators and competitors. Adding spice to the ceremony was the fact that nobody, bar the officials, knew the final results, although everyone had been kept up to date throughout the day as progress was monitored on the scoreboard.

Like some sort of off-beat beauty contest, the teams were announced in reverse order and each was given a roar of approval.

When it was all over, I spoke to Mike Hawtree of Rowntree Mackintosh I, "We thought we might finish second or third, but we didn't think we had any great chance of winning," he said.

At one point Birte Andersen, the SAS number one seed, looked like winning the ladies' individual title in addition to contributing to the team victory. She said: "We have a sports club at SAS, but we took part in this competition just for fun. I am not the best girls' athlete at our club."

Other Computastars emerged during the day. Principal organiser, Gordon Cairns, could be seen throughout the contest performing as the referee, and special mention must be made of scorers Beverley Harrhy and George Simpson who worked non-stop throughout the day.

The team trophies were presented by the Ferguson Francis consultancy partnership and Computer Weekly donated the individual awards. In addition all members of the first three Men's and Women's teams and the first three in the individual classes were awarded medals presented by Wright Air Conditioning. These were distributed at the finals by Colin Brooke, managing director of WAC's London company.

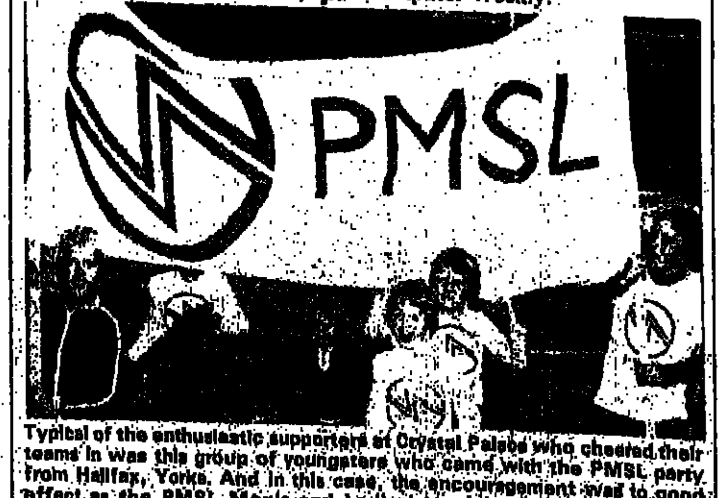
Computastars was organised by Goldsmith Recruitment International with the support of Computer Weekly.

Computastar champion Martin Rigby, with his team mates of Rowntree Mackintosh I, receives the Francis Ferguson team trophy from Mrs Gordon Cairns.

Gayle May of Case, individual Ladies Computastar champion, with CW editor Malcolm Peltu, who presented her with the Computer Weekly rose bowl.

Gordon Cairns, chief organiser of the competition, relaxes after presenting the Ladies team trophy to the SAS girls.

Individual Men's Computastar champion Martin Rigby, of Rowntree Mackintosh I, is presented with the Computer Weekly cup by John Godley, CW's group advertising and sales manager.



Typical of the enthusiastic supporters at Crystal Palace who cheered their teams in was this group of youngsters who came with the PMSL party from Halifax, Yorks. And in this case, the encouragement was to good effect as the PMSL Men's and Ladies' teams achieved the highest aggregate score to win the Queen's Hotel Company Cup.

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Letters to the Editor

Economics of leisure

I AM following with increasing astonishment the discussion in your columns about how, after the microprocessor, we may manage to make leisure tolerable.

As a lecturer I have just enjoyed a 10-week holiday. My feeling at the end was not one of relief at returning to work, but rather of regret for all those things I had not had time to accomplish. Most of my colleagues also seem to feel that, provided the payslips kept coming, they could have made good use of a far longer break.

More strikingly, the Protestant writer James Howell, writing in 1624, reckoned that in Catholic Spain days amounting to more than five months were kept as festivals. He deplored this idleness, but there is no evidence that the Spanish peasantry shared his view.

What both they and I (and for that matter the royal family, who have never demanded the right to work) share is that we have an income sufficient to enable us to do what we want (at least to some degree) in our leisure time.

The problem facing those on the dole is surely not leisure, but leisure combined with poverty. Some of your correspondents have recognised this and have suggested that we should in future deal more generously with the unemployed. But isn't this just begging the question?

The transition from four or five months of holiday in the year to a 16-hour day/six-day week occurred as a direct result of the first industrial revolution — when productive power was rising faster than ever before or since.

This was primarily because in the competitive market that then existed it was necessary for its survival that each firm should produce more cheaply than its rivals.

Consequently the profit that might otherwise have gone to ensure the well-being of the poorer sections of the community had perforce to be devoted to ongoing technological innovation.

We are told we are about to enter the second industrial revolution. The barons of industry are as emphatic as ever about the need to plough back every available penny so that they can compete with their rivals. What I should like to see therefore is some discussion as to whether the enlightened social policies advocated by Barry Sherman et al, can possibly be carried out under our present economic system, or, if not, what we ought to do about it.

LUCY WARBURTON
London

Two schools of thought on jobs

YOU report the remarks by Clive Jenkins and Albert Booth about forthcoming unemployment (CW, September 2). There are two schools of thought; the first says that in the history of mechanisation since the industrial revolution, innovations have not, in the long term, resulted in unemployment, although of course there has been a substantial redistribution of employment.

The other school says that no parallels can be drawn with history because the rate of change is now so much faster, and there are strong reasons for believing that there is limited scope for retraining or redistribution. There are plenty of prophets of doom in the second school.

It is quite hard to connect cause and effect in this area and so the prophets are usually unable to come up with hard facts. This is partly because the trend has not yet gathered momentum, but when and if it does human misery and energy expended in confrontations could be substantial.

I discussed this subject in an article "The Paperless Revolution" (Wireless World, July/August 1978) suggesting that the fortunes of persons displaced by specific innovations should be followed. What is the net effect upon such persons?

I don't believe that technologists are likely to concern themselves with this issue; most sociologists don't have a wide enough grounding in technology to understand the technical interrelatedness of new developments. However there may be a few "sociotechnologists" about, perhaps at Universities.

I make the positive suggestion that they be identified and provided with grants in order to conduct investigations and collect case evidence now. Next year may be too late — the confrontations may have started by then. Part of the grant should be used for ensuring that their findings receive maximum publicity.

A. E. CAWKELL
Institute for Scientific Information,
Uxbridge.

Standards: do we need BCS?

IN his article Professor Samet has convincingly argued for "professional standards among computer personnel at all levels" (CW, September 7). What he does not satisfactorily explain is why a body such as the British Computer Society is desirable in order to maintain such standards.

One of the main functions of the engineering and other institutions was to ensure that tasks were "only executed by or under the direction of appropriately qualified personnel," such personnel being mainly self-employed.

As persons involved in computing today are nearly all employees, is it not appropriate that this function, together with the maintenance of professional standards, should be the responsibility of employers?

I. DRUMMOND
Norwich

Jargon is as jargon does

MY piece on "Cognitive Horizons" (Privateview, August 31) has caused two readers to boil over. Mr C. G. Breiner (Letters, September 14), apparently came to the boil without reading *what I actually wrote.*

The biological parallel drawn in my article in Computer Weekly (as distinct from the one in the pages of Mr Breiner's imagination) was not with competition between two species occupying the same ecological niche, but with the phenomenon of parasitism, where one organism provides a protective niche for the other.

My concern is that in the evolution of complex computing systems and of human societies the relationship between the two should be symbiosis, each providing protection and support for the other with mutual benefit. My case is not that this will be promoted by machine systems being exactly human-like, but that both parties should at least be able to conduct their transactions using a common language of human-like concepts.

Mr S. Keery (ibid) complains that he does not understand my article. He thinks he knows why. His claim is that it is the jargon which has numbed his mind. If I knew of more concise phrases than those in the ready-made technical vocabulary ("receptor and effector organs," "inference procedures" and the like) I would use them. I await his suggestions.

Meanwhile Mr Keery may find it helps in removing numbness to visit a library. Privateviews over the past year contain plentiful references.

DONALD MICHIE
Edinburgh

Hex Kidology?

I WAS deeply gratified to read in Computer Weekly, on the authority of no less a person than Mr Richard Forsyth, author of Ascii Through the Logic Gate, of the impressive influence my company is to have on the world's future.

According to Mr Forsyth (Hex Kid, Bock 14, September 7), "... a secret team of specialists working in a subterranean cavern deep within the bowels of the Sierra Nueva, unknown to all but a few high-ranking System officials. This team, the Advanced System Group, had one overriding objective — to design the successor not just for mankind (which was already obsolete) but for the robots and androids man had created in his own image — for the System as a whole."

PAMELA D. GOWER
Marketing Services Manager
Advanced Systems
London

Competitive market

THE review of two new publications from NCC (Software File, August 31) on Teleprocessing monitor packages for IBM 370s and ICL 2903/04s, raised several points we should like to clarify. The two major criticisms are forceful ones, yet they arise from the difficulties inherent in the content of these books.

The packaged software market is a very competitive one where changes are rapid as new products appear and existing ones are enhanced. We endeavoured to incorporate changes brought to our attention, but inevitably some will have eluded us.

A selection of available packages was intended, rather than a fully comprehensive buyer's guide. We would always advise potential buyers to reinforce the information by holding detailed discussion with the suppliers.

These two books are planned as part of a series covering packages applicable to different ranges of hardware.

The initial response to the books has been a gratifying one, encouraging us to believe they go some way towards meeting the objectives we set for them.

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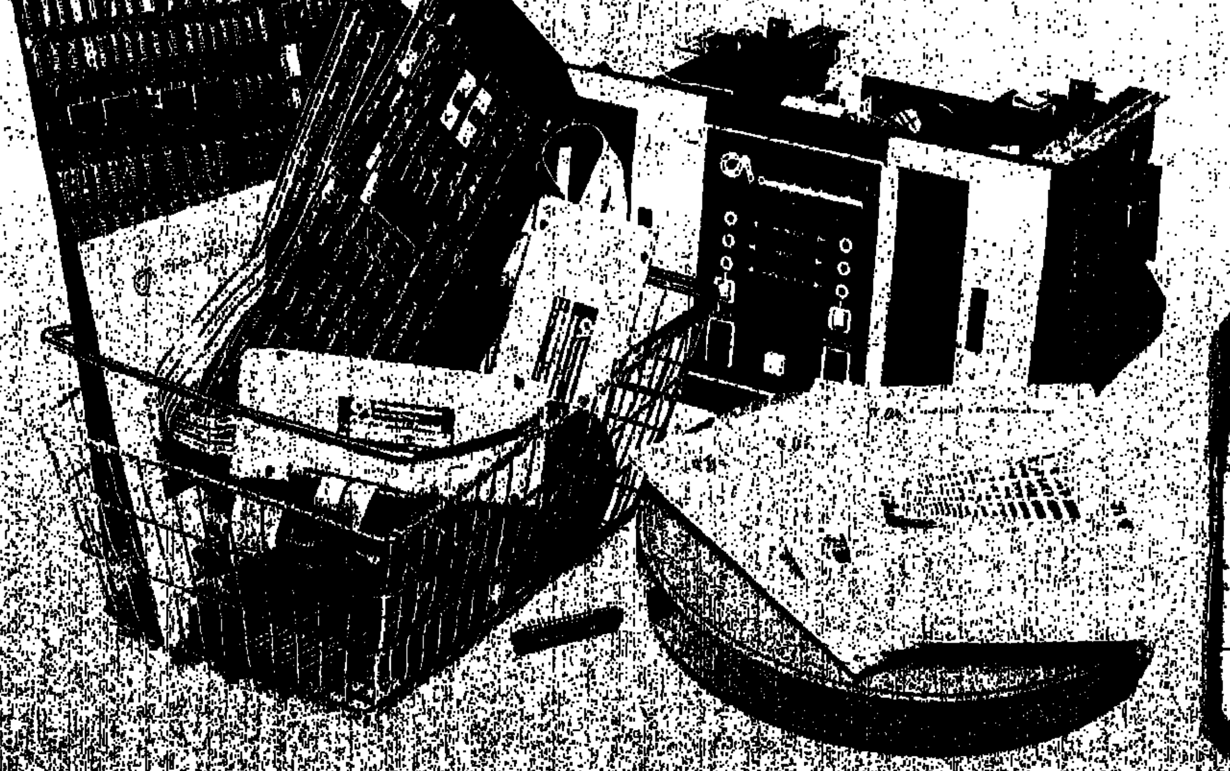

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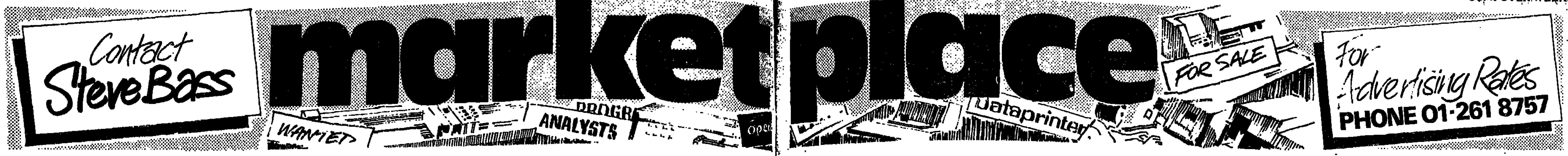

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H-P introduces SOS-based systems

IN a continuing exploitation of its success with silicon on sapphire integrated circuit technology, Hewlett Packard this week introduces two new computer systems that fill out the product range between the HP250 small business machine, and the HP3000 Series II and Series III hardware.

Both based on the same basic SOS three chip processor set, but each with different operating firmware, the systems are the HP300 and the HP3000 Series 33.

The HP300 is intended as a low cost general-purpose business computer which, in transaction processing environments, can support up to 16 terminals.

Priced at from £24,000, it incorporates both HP business Basic and RPG-II software, 256Kbytes of main memory, a 1Mbyte floppy disc drive, and a 12Mbyte fixed disc. The internal memory can be expanded up to 1Mbyte with error correction facilities, while secondary storage can be increased up to 240Mbytes of disc.

The system is based on an entirely new virtual memory operating system called Amigo/300, which gives it the personality of a multiprogramming, multitasking system capable of managing background work while running higher priority jobs.

As an option, the Image/300 database management is also available. This is a subset of Image/3000, and is accessible via Basic.

Data communications facilities for HP distributed systems networking will be available later.

The HP3000 Series 33 is a reduced power version of the Series II/III machines, that has been slimmed down to fit into a desk-sized enclosure by using the three chip SOS processor set.

Running the majority of software available for the two bigger machines, the Series 33 differs in several ways. It is rated by the company at about 70% of the power of a Series II, and it runs at about 70% of the bigger machine's operating speed. The number of terminals it can support, 32, is smaller than the Series II at 62, and at a maximum of 1Mbyte, it has half the main memory potential. Pricing starts at £45,600.

Software available for the system includes the MPE-III operating system, common to all the 3000 series hardware, as well as the SPL-3000 systems programming language. For applications programming, there is Cobol, RPG, Fortran and Basic.

For database management, the system will have HP's Image 3000 package.

For transaction processing applications, HP is introducing a new software package, View-3000, aimed at the easy creation on a display terminal of business' forms.

Diagnostics for the system are covered by an integral microcomputer, and plug-in data cartridge. Using a modem, interactive control of this can be passed over to an HP engineer at any remote location.

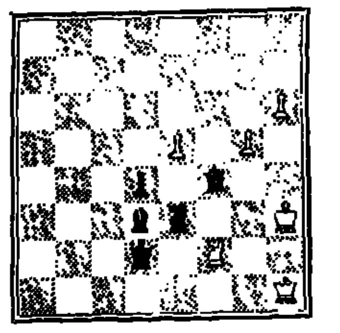
Fillingout its product range between the HP250 and the HP3000 Series II/III machines, Hewlett Packard has this week introduced two new systems. On the left is the HP300, a general purpose low-cost business computer and, on the right, the HP3000 Series 33, a "reduced" 3000 in both power and size. Both use silicon-on-sapphire based CPU chip sets.

CHESSLAB

Shorter way to win the Queen

By Donald Michie

IN my last Chesslab (CW, September 7), the position shown in the diagram was given and I described it as taken from du Mont "together with the published solutions and analysis.



Through a lapse on my part, du Mont's actual solution was omitted. This was unfortunate since readers had been urged to see if they could improve on the published solution, as had been done by J. Pitrat's "intelligent" program for chess combinations.

Here is the missing line as given in du Mont

1 Qh1e1 + Kd2c2

(K × e1 loses the Bishop to an immediate Knight fork

2 Qe1c1 + Kc2b3
3 Qc1b2 + Kb3c4
4 Qb2b4 + Kc4d5
5 Qb4d6 + Kd5c4
6 Qd6c5 + Kc4b3
7 Qc5b4 + Kb3c2
8 Qb4b2 + Kc2 × b2
9 Nfc × d3 + K moves
10 Nd3 × f4

Pitrat's Program finds a shorter combination, which wins the Queen instead of the Bishop. So too did two readers, David Bax, of 27 Harlesden Road, St Alban's, Herts, and Frank Little, of 47 Christopher Road, Ynysforgan, Swansea.

The winning combination diverges from du Mont's after the first four moves as follows.

5 Qb4c5 + Kd5e6
6 Qc5d6 + Ke6f7
7 e5e6 + K moves
8 Qd6xf4

Other readers re-discovered du Mont's solution but not the Queen-winning improvement

The Pitrat program was described as "intelligent" to draw the contrast with brute-force strategies such as that which John Moussouris hard-wired into the MIT micro-electronic chess lookahead machine Cheops This marvel of the semiconductor age was lashed up to a version of the Greenblatt program MacHack for a two-game match with David Levy during the last throes of the Levy bet.

Working in "blunder-stopper" mode it was able to examine of the order of 10 million positions in lookahead search before opining on the soundness of each move proposed by MacHack. Levy, although ultimately victorious was given a long-drawn-out run for his money. Here the record of the first game (condensed algebraic notation).

WHITE **BLACK**
D. N. L. Levy McHack/
Cheops

1	e4	c5
2	Nf3	d6
3	d4	cd
4	Nd4	Nf6
5	Nc3	g6
6	f4	Bg7
7	e5	Nh5
8	Bb5 +	Bd7
9	e6	fe
10	Ne6	Bc3 +
11	bc	Qc8
12	Qd4	Nf6
13	Qc4	Nc6
14	Nd4	Nd4
15	cd	Qc4
16	Bc4	Bf5
17	Bb5 +	Kf7
18	Bc4 +	d5
19	Bd3	Rhc8
20	0-0	Rc7
21	Rb1	Rac8
22	Be3	Ne4
23	Rf3	Nd6
24	Rb2	B6
25	A4	Bd3
26	C6	Rc3
27	Rh3	h5
28	Bd2	Rc2
29	Rc2	Rc2
30	Be1	Nf5
31	a5	ba
32	Ba5	Nd4
33	Re3	Ra2
34	Bc7	a5
35	Re1	a4
36	Be5	Nc6
37	Bh8	a3
38	Rd1	Rc2
39	Ba1	a2
40	h3	Na5
41	d4	Nb3
42	f5	Rc1
43	Rc1	*resigns*

David Levy in association with the new periodical Omni, has announced a prize of $5,000 for the first team to produce a program which beats him. He has put up $1,000 of the total and the magazine has guaranteed the rest. No time limit. If your program is good enough just challenge!

Canada hopes to start field trials of own viewdata next year

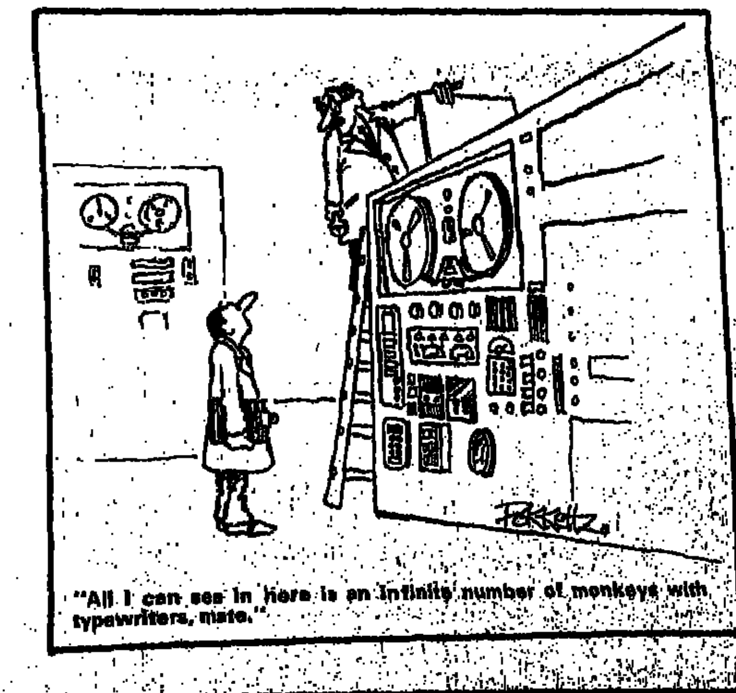
CANADA is developing its own teletext/viewdata service called Videotex because, says Communications Minister Jeanne Sauvé, Canada's version has great advantages over the existing UK and French systems, including better resolution of screen images, flexibility, compatibility with different terminals and the capacity for growth.

A $245,000 contract has been awarded to Norpak of Peckenham, Ontario to develop Videotex hardware and field trials of the systems will begin next year.

Videotex will enable users to access any data bank linked into the system, insert text, graphics or tonal information into the data bank, or directly interact with any other terminal on the system. The user's equipment is expected to cost $200 to $300 in addition to a television set, and large scale integration should bring this price down within four or five years.

The transmission media which can be used include normal telephone lines, modified cable TV circuits and optical fibre links.

The Videotex development is part of a programme to use technology as quickly as possible in a co-ordinated strategy to conform to overall objectives for communications in Canada. Other projects to receive encouragement and backing from Sauvé's Department of Communications include fibre optic and satellite links.



"All I can see in here is an infinite number of monkeys with typewriters, mate."

Group revived

THE old BCS Data Transmission Specialist Group is being revived as the Data Communications group, and its first meeting at the City University on October 10 at 6pm will focus on the CCITT X-series data communications protocols with an explanatory talk by Roger Scantlebury of Logica.

Indian link-up

THE joint venture between Burroughs and the giant Indian Tata conglomerate to manufacture peripherals in India, plans for which were exclusively revealed in Computer Weekly (July 4, 1974) has now been formed. The company, owned 50:50 by the two partners will initially assemble document printers.

CONFERENCES

THE European Computer Measurement Association is holding its Ecoma-6 conference on October 17-19 at the Tara Hotel, London. It will feature two seminars on computer performance modelling by Dr Jeffrey Buzen, of BGS Systems Inc, a series of professional development seminars by users of performance measurement tools, and the first European live demonstration of the Univac benchmark monitor display. Further details of ECOMA and the conference from Scott N. Yasler, President, European Computer Measurement Association, Scheuchzerstrasse 5, CH-8006 Zurich. Tel. 01-281268.

PUBLIC Information Systems is the title of a seminar to be offered by Imperial College's Department of Management Science on October 20. Chairman will be Financial Times film and video correspondent John Chittock, and there will be speakers from the BBC, Open University and the Post Office. Further details from Dr J. O. Jenkins, Assistant Director, Department of Management Science, Imperial College, Exhibition Road, London, SW7. Tel. 01-589 5111, ext 2802.

THE second Scottish Word Processing Conference and Exhibition will be held in the City Hall, Glasgow, on October 30. Further information on the event can be obtained from the Conference Convenor, James Hughes, Morrisons Associated Companies Ltd, 120 Howard Street, Glasgow G1 4DU. Tel. 041-221 0431.

DESIGNED for those considering setting up systems for the conversational interrogation of in-house computer held information, a seminar entitled In-house computer solutions to information handling, will take place on October 31-November 1, at the NCC in Manchester. It has been organised by the Northern branch of the Institute of Information Scientists and the British Computer Society. Further details from G. Cousins, Technical Information unit, ICI Pharmaceuticals Div, Mereside, Alderley Park, Macclesfield, Cheshire SL10 4TG.

THREE regional management conferences are to be held this winter by Lamsac, the Local Authorities Management Services and Computer Committee. They are intended for elected members and chief officers in local government, and their collective title is The Best Use of Resources. They will take place in Bournemouth from October 30 to November 2, in Cardiff January 15-18, and in Scarborough March 19-22. Further details from S. R. Barnes, Director, LAMSAC, 3 Buckingham Gate, London SW1E 6JH.

THIS year the British Production and Inventory Control Society, BPICS, has linked its conference with the British Institute of Management's SPUR initiative: Strategy, Performance and Utilisation of Resources. The conference will take place from November 3-5 in Birmingham, and its title is Better Production and Inventory Control via Spur. Further details from BPICS, 114 Rodmell Avenue, Saltdean, Brighton, tel: Brighton (0273) 38188.

THE Practical Application of Computers in the Foundry Industry is the title of the fifth computer conference of BNF Metals Technology Centre. The conference will be held from November 27-28 at the Hilton Hotel, Stratford-on-Avon. Further information can be obtained from BNF Metals Technology Centre, Grove Laboratories, Denchworth Road, Wantage, Oxon OX12 9BJ, tel: 023-57 2992.

AN international conference on data regulation, sub-titled European and Third World Realities, has been organised by On-line, and will take place from November 28-30 in New York. It is aimed at representatives from commerce, industry and government who have an interest in the costs and conditions of international data communications. For further information contact Online, Cleveland Road, Uxbridge, UB[illegible] 2DD, tel. 0895 39202.

THE Institution of Electrical Engineers has organised a conference entitled Antennas and propagation designed to promote interaction between those active in the fields of antenna theory and design and the of electromagnetic wave propagation. It will be held at the Institution for November 28-30, and further information can be had from the Conference Dept, IEE, Savoy Place, London WC2R 0BL, tel: 01-240 [illegible]

THE second International On-Line Information Meeting, organised by On-line Review, will be held at the Commonwealth Institute, London from December 5-8. Further details from the Organising Secretary, International On-Line Information Meeting, On-Line Review, Woodside, Hinksey Hill, Oxford, OX1 [illegible] tel: Oxford 730275.

Call for papers

PAPERS are solicited for an international conference in Israel on literary and linguistic computing, to be held on April 23-26, 1979. The conference is sponsored by the Association for Literary and Linguistic Computing, the Information Processing Association of Israel, Tel-Aviv University, Hebrew University, [illegible] and Bar-Ilan University. Working languages will be English and French. Notice of the intention to submit a paper should be sent to Dr Zvi Malachi, the Katz [illegible] for Literary Research, Tel-Aviv University, Tel-Aviv, Israel by October [illegible]. Further information may be obtained from the same address.

ICL growth 'not fully reflected in share price' say brokers

THE most rigorous analysis of ICL's business published in the last 18 months has appeared from stockbrokers Wood, Mackenzie & Co.

The report opens with a nine-page summary followed by detailed sections on the company's position in the international market; a review of the first 10 years; ICL's products and services; the financing of the lease and rental base; relationship with the government; the immediate outlook; and future competition.

Despite the keen analysis, the conclusions reached by the report, written by Wood Mackenzie's Graham Meek, are in line with those of almost all the other recent reports on ICL: the fundamental improvement in the company's product and financial position and its prospects of further above-average earnings growth are still not fully reflected in the share price. Meek warns investors, however, that the shares may well take a temporary dip when IBM announces the E-Series.

The report looks in detail at ICL's policy of moving away from leasing through third party companies and towards internally-financed direct rental, and points out that expansion of the rental base has been financed by increased borrowing. It suggests that ICL is therefore likely to seek further capital via a rights issue some time in the next 18 months.

Unlike IBM, which has a very broad spread of rental to purchase price ratios of different products, ICL sells all its products at a rather conservative 40 to 45 months' rental price right across the board.

The report points out that ICL's standing among its competitors is by no means unfavourable. Although ICL's net profit margin of 4.3% last year was a long way behind IBM's 15% and Burroughs' and DEC's 10.1%, it was ahead of those of Control Data, Honeywell, Univac.

Elsewhere in the report it is indicated that ICL's profitability is also well ahead of CII-HB, especially if French government support is taken out of the latter's figures, while Siemens, Fujitsu and Nippon Electric all lost money on computers.

For the year which closed last Friday, Meek forecasts that ICL's turnover will have reached £520 million; the figures will not be announced until December.

Of this he estimates that some 17%, £90 million, came from the large 2900s; about 18% £93 million, from the 2903 and 4; 17%, £88 million, from 1900 series and System 4; 13.5%, £70 million from ex-Singer products; and 34%, £179 million, from maintenance, software and services.

4m jobless forecast

● From front page

is a great deal of positive contribution in the report. For example, it calls for the establishment of a Ministry of Information Technology, a call first made a last year's Hedsor Park conference (CW July 21, 1977). It points to the importance of this by reference to the fact that information technology will have an effect on up to 95% of the nation's economy.

Government money, the report suggests, should be spent on creating an active programme of investment in an advanced telecommunications system, which would give an infrastructure for an information based society, and create a market for it.

This system should look more like the electricity supply than the current telephone network. In particular, it rejects the current activity in the packet switching area, which it condemns as being too small for a truly national network and, especially at the nodal switches, too complicated.

Ten-month delay on vital PO equipment

WHEN restrictive policies on Post Office equipment, and supply delays, were criticised last week by John McNulty, of Modular Technology, at a conference on the future of the corporation's telecommunications systems, he won sympathetic response from Freddie Phillips, Post Office director of marketing.

McNulty spoke of a 10-month delay on the delivery of auto dialling equipment. This equipment, he said, was essential to the Midnight Line service which provides limitless inland line connections overnight for data transmission or voice for £200 a year.

PHILLIPS ..... "Post Office's good intentions proved."

Phillips promised he would look into the complaint and said to McNulty, "We need more people like you to talk to us more often."

Problems of connection of non-Post Office equipment were also aired by McNulty, who claimed that although it was permitted if no appropriate Post Office equipment was available, this did not happen. Requests to connect intelligent telex machines were rejected in favour of Post Office "stupid" terminals.

Phillips refuted this and said that the Post Office's good intentions were proved by the fact that 2,000 private 4,800bps modems were connected to the public switched network. The Post Office does not yet supply such units.

McNulty also complained about London Radiophone which has a manual exchange. There was no technological reason, he said, why direct dialling could not be offered.

During discussions of the conference, which was run by Information Services, it emerged that telecommunications headquarters would be glad to shed its equipment connection monopoly because of the cost of its stockholding obligations. However, it was suggested that this would prove difficult in the short term, since British manufacturers were not geared up to meet demand. It was feared foreign manufacturers could flood the market and create serious problems for the industry.

It was mentioned that the target date for freeing the interconnection of digital equipment was 1985, by which time the System X overlay would give business users direct digital connection to the network without the need for modems.

Outlining the telecommuncations division's future plans, Geof Dale, head of data communications marketing, confirmed that the Packet Switched Service would be operating in late 1979 or early 1980, as a nine node network wth X25 interfacing. It would support a range of speed up to the CCITT recommended 48K bps, offer a connect time of less than one second, and an error rate superior to the telephone network.

Boots puts product code equipment on trial

AS part of its plans eventually to install an integrated point-of-sale system, Boots has installed four Sweda 800 terminals at one of its smaller branches in Sheffield to test the effectiveness of using Universal Product Code markings on its product lines.

Over 400 product lines now have UPC markings incorporated in their package design and these will be read by optical mark readers attached to the Sweda 800 terminals.

Trials began at the beginning of this month and are expected to continue for another five months.

Boots has been using 60 Sweda 800 terminals, linked to an in-store Sweda 80 minicomputer, at its large store in Sheffield, on an experimental basis since 1973. Price marking there is achieved by attaching magnetically encoded labels.

National offers three new OEM memory boards

THREE new OEM memory boards are to be introduced by National Semiconductor, two of which are intended for Digital Equipment systems, while the third is for Data General's Nova 3 machine.

The Nova board, known as the NS D/3, is a replacement/enhancement module that offers 128K words of dynamic RAM. It will be available with error correction code and error logger options, and will also have the option of battery back-up. Quoted access and cycle times for the board are 340 nanoseconds and 600 nanoseconds respectively.

Of the two DEC boards, one is intended for the LSI-11 and PDP-11/03 systems; the other is for the PDP-11/34.

The former, the NS11/2P, offers 32Kx18 bit words of RAM storage, designed as a replacement/enhancement module for the LSI-11, PDP-11/03 and LSI-11/2 systems. In addition to providing the entire LSI-11 address space on a single, half-size board, it offers optional parity bits, internal or external refresh, battery back-up and an access time of 300 nanoseconds and a cycle time of 550 nanoseconds.

For the PDP-11/34, National is making available the NS11/34Q board. This 128Kx18 bit word dynamic RAM board features an access time of 300 nanoseconds and a cycle time of 500 nanoseconds, and provides the entire address space of the PDP-11/34 on one board. In addition it has on-board parity generation and checking, thus dispensing with the M7850 controller.

Classic installation

TO help expand its computer services to the oil and gas industries, Continental Computer Bureau, a Channel Islands-based petroleum production consultancy, is to install a Modcomp Classic 7860 system. It will replace a Modcomp II computer and be used as a central system supporting remote and local based terminals, and run as an intelligent terminal linked to a Control Data mainframe in Paris.

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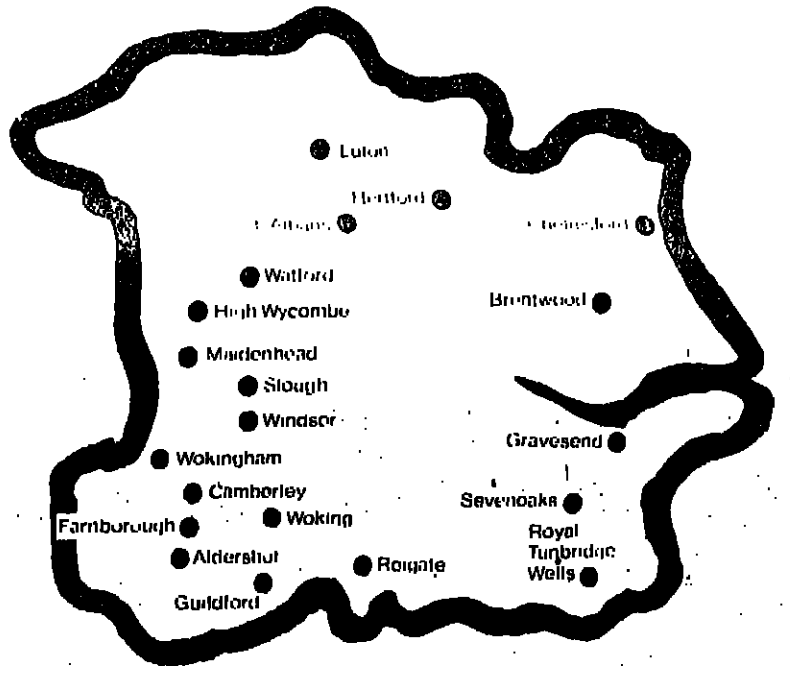

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Computer Weekly. The industry journal for the data processing professional.

*Computer Weekly circulation in Greater London area Sept, 1978

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LONDON 01-935 0671
Freepost 6, 102, Blandford Street,
London W1E 1JZ

Computing Services Association

JBA

Data Base Consultants

London Based **up to £12,000**

Applications are invited from senior Data Base Specialists with a wide computing and business background to join a leading consultancy.
Candidates should have experience of special analysis and design methods appropriate to the database approach and have worked with at least one of the proprietary systems.
Appointees will be required to work on a variety of client projects, ranging from advising on feasibility through to the detailed design and implementation of specific applications.
The ability to work in a sophisticated environment, coupled with the drive, personality and technical expertise to communicate on the same level as senior managers is of paramount importance. **Contact: Margaret Stevens**

Software Designer

Holland **c £14,000 pa**

Our client is one of the largest and most professional computer consultancies in the world with an interest in virtually every kind of development activity in computing.
They have an immediate requirement for a Systems Software Designer to join a small development team in Holland, which is specifying interactive language capabilities for commercial uses. The successful applicant will naturally have a design background covering compilers, interpreters and on-line utilities.
A superb opportunity to become involved in a fast expanding and increasingly important area of development and to experience the Dutch way of life as part of one of the most prestigious organisations. **Contact: Andy Wright**

Consultant Programmers

Home Counties **up to £8,000**

A large well established computer services organisation has opportunities for senior programming professionals to join a team giving advice and assistance to client companies.
Applicants must have at least six years experience in a commercial environment, specialising in either software or applications programming. Knowledge of database, communications real-time and programming techniques would be most desirable.
These are ideal openings for senior staff with proven records who have reached top positions in their current organisations and are looking for a career in technical consultancy.
Excellent salaries and large company benefits. **Contact: Jim Baker**

Technical Authors

UK: up to £7,000 **Europe: up to £13,000 +**

A number of our clients still have vacancies for both experienced Authors and Programmers who have a flair for documentation and a real desire to devote their time more completely in this area of d.p. The positions available in the UK are staff career positions and we would like the opportunity to discuss these aspects with any applicants who call us.
The overseas opportunities will be project orientated and thus contractual in nature with certain tax advantages built into quite attractive packages.
All vacancies are definitely software biased but we'd like to talk to anyone who wishes to explore a move into technical documentation - a service that is rapidly emerging as one of the real professional activities in d.p.
Contact: Mike Creamer

Mini/Micro Computer Engineers

London **to £8,000**

Scicon, a member of the BP Group of Companies, has an international reputation for the advanced application of mini and micro computer technology. Planned growth in the development of hardware/software systems has created opportunities for high calibre engineers to join their specialist Hardware and Engineering Services Division.
The work is highly varied and interesting. If you have broad experience which includes some of the following:

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Scicon can offer a challenging career and an environment where initiative and commitment are encouraged and rewarded. Good starting salaries and excellent conditions of employment also apply. **Contact: Margaret Stevens**

Training Officer

Middlesex **Salary negotiable**

Ideal opportunity for someone who enjoys training to enter a large, well known company with many diverse interests. Duties will include recruiting and training computer programmers from scratch, arranging and visiting local schools to give advice on training matters.
Applicants must be sound COBOL programmers thoroughly self-motivated and able to communicate at all levels. Some previous teaching or administrative experience is a definite bonus.
Excellent employment conditions and benefits. Please call us, we'd like to tell you about this very interesting vacancy. **Contact: Mike Creamer**

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

FORTRAN/ALGOL/ CORAL/BASIC PROGRAMMERS

c £5,500

Several of our clients, situated in Central London, Sussex, Surrey and Berks are seeking people with experience of writing programs in at least one of the above languages.
Applications include mathematical simulation, avionics, telecommunications and some commercial projects. Real time experience an added advantage.
If these vacancies interest you telephone our office NOW for an application form. Evenings: try 01-767 0611 between 7 pm and 8 pm

AMES PERSONNEL

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School Examinations Department
University of London

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- ★ Salary scales up to £7006
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The above Department requires for its small Computer team an Analyst/Programmer with at least 18 months practical experience especially of Systems and Program Design and a Programmer with about 12 months practical programming experience.

Applicants for both posts must have the appropriate period of practical experience of programming in ICL, Plan or COBOL, but preferably both.

For further details contact Miss J. A. Slater, Assistant Personnel Officer, School Examinations Department, 66/72 Gower Street, London, WC1E 6EE. Telephone 01-636 8000 ext 80.

Systems Analysts

A DP challenge in the Oil Industry.

The British National Oil Corporation with its deep involvement in exploration and production on the UK Continental Shelf is now developing a distributed processing network to meet the diverse requirements of the Corporation's activities in Aberdeen, Glasgow and London.

Systems Analysts and Senior Systems Analysts are required to develop and implement systems within a DP environment based on mini-computers linked to ICL 2900 series equipment. These cover a wide range of application areas, both Commercial and Technical, and utilise Transaction Processing and Data Base Management techniques.

The successful candidates, male or female, should:

- have at least 2 years substantial experience in the development and implementation of computer systems.
- be able to demonstrate a professional approach to the practice of data processing.
- have had some exposure to TP, DBMS and communications techniques.

These Glasgow based posts offer the challenging environment of the oil industry with exceptional opportunities for career development and scope for broadening technical knowledge.

Salaries and conditions of employment, including relocation expenses where appropriate, form an attractive package.

If you are interested in this opportunity, please write or telephone for an application form indicating which post interests you, and quoting reference (CW KM) to:

The Group Personnel Manager,
The British National Oil Corporation,
150 St. Vincent Street,
Glasgow
G2 5LJ.

Telephone Number: 041-204 2525.

BNOC The British National Oil Corporation

Analysts

£5,500/£6,800

Broaden your experience by joining a consultancy currently working with

IBM, ICL, VARIAN, DEC, DATA GENERAL, T.I., WANG, HEWLETT PACKARD equipment

We are a well established computer consultancy and software house within the Fraser Williams Group. Most of our work is in the Greater London area.

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Contact: Ian Gold/Simon Chapman
Fraser Williams (London) Ltd.,
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London. W1P 5PD.
Tel: 01-388 0036.

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PROJECT LEADER

Universities Statistical Record

Salary range £6,793-£7,754 (under review)

The Universities Statistical Record is maintained by UCCA in order to provide statistics of university staff and students. Expansion is expected both in the variety of data collected and the retrieval facilities provided.

A project leader is required to control the team of analysts and programmers responsible for maintaining and developing the systems for updating the files and producing the statistics.

Sound experience in systems design and implementation is essential, and some project control experience would be an advantage.

The present computer is a UNIVAC 90/60 which will soon be operating under VS9 software.

Applications giving full details of career to date should be sent to

Personnel Officer,
UCCA, P.O. Box 28
Cheltenham, Glos.
GL50 1HY.

Inner London Education Authority

Schools Service Senior Programmer

Salary Scale: £4,819-£6,643
(inclusive of London Weighting and Phase 1 supplement)

This post is designed to provide software support for the authority's computing service to secondary schools and colleges of further education. The work is diverse and will comprise programming to improve the flexibility of the systems, applications programming in specific topics and general duties concerned with administration of the service.
The post is seconded to the City of London Polytechnic Computer Centre.
Applicants should be graduates (or BCS equivalent) with sound programming experience and an interest in educational computing.
Further details and application forms from the Education Officer (EO/Estab 2A/1), Room 367, The County Hall, London SE1 7PB. Please enclose a stamped addressed foolscap envelope.
Forms to be returned by Friday, 20 October, 1978.

COMBYTE SERVICES LIMITED

Combybe Services Limited
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12-13 Henrietta St.,
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PERMANENT REQUIREMENTS

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Beds	Project Leader A/P 2900 RPGII/COBOL	to £7k + car
London	Data-Base Consultant/Designer	to £9.5k
N. London	Snr Analyst/Programmer. Sys 3 or Financial	to £7k
C. London	Programmer. Basic + RSTSE. Macro useful	£neg

OPERATIONS

E. London	Shift Leader IBM DOS experience essential	c. £5.5k
City	Trainee Operators for PDP. School leaver 'A' levels	c £2.4k
N. London	Operator System 3 experience. 2 shifts	to £4k
E. London	Ops Analyst: DOS. No shifts. Experience essential	to £6k

For further information contact
MARILYN DAVIDSON
on the above number

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Capable programmers are required with at least three years' experience of high-level and assembly languages. Cobol prefered. The companies training programme aims continually to broaden and update the knowledge of its staff

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Tel: Welwyn 6065

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Attwood Statistics, one of the largest Market Research organisations in Great Britain, are looking for a person to train in the methods of their production planning department.

The successful applicant will be in the age range of 25/35 years, will have had at least 5 years commercial experience working in a computer environment and will need to be particularly interested in planning computer work.

The applicant, preferably educated to degree standard, must have at least 'A' level maths.

A substantial salary will be paid according to training and experience.

The company is situated in Berkhamsted, with adequate car parking facilities.

Please apply in writing in the first instance giving details of education, trainign and experience to

Mr S. Whatley, Personnel Officer
ATTWOOD STATISTICS (G.B.) LTD
Northbridge Road, Berkhamsted, Herts

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Here's one job that won't cramp your style

At Marconi Avionics in Borehamwood, we already use a wide range of machines and languages to handle the processing tasks inherent in our advanced airborne radar systems.

In the future that range will be wider still, with new programming languages and new systems based not just on micros but on networks of micros.

To help us make effective use of the new machines and languages coming over the horizon, we need a number of compiler writers – language experts capable of creating a compiler from a manufacturer's specification.

We realise that very few men and women will have the depth of specialist experience we need, and the salary we're offering reflects that fact.

But more important still are the opportunities we can give you to use your expertise to the full – to an even greater extent than an equivalent role in a software house or even a university

If you'd like the opportunity to stretch your language capabilities and experience to the full, contact Tim Swann on 01-953 2030, extension 3239.

MARCONI AVIONICS
A GEC-Marconi Electronics Company

Alternatively, write to
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Please quote reference 78113.

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But a meeting with some influential people down in London put bigger ideas in his head.

And the rest, as they say, is history.

There is a group of people in London who could put some big ideas in your head.

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You'll be joining an expanding section specializing in the translation of Switching System Documentation (Software and Hardware) from German into English.

Linguistic expertise is more important than formal qualifications.

Ideally you will be of English mother tongue with an excellent command of German.

There are also a number of openings for **FREELANCE TRANSLATORS** with similar qualifications and experience.

Excellent remuneration and working conditions are offered.

Address your application to:
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SIEMENS LIMITED,
Siemens House, Windmill Road,
Sunbury-on-Thames, TW16 7HS.

LEADERS IN DISTRIBUTED DATA PROCESSING
ventek
A TRW AFFILIATE COMPANY

Ventek need more computer professionals

SALES SALES EXECUTIVES (required throughout the U.K.).
SALES OFFICE ADMINISTRATORS.
SALES TRAINEES (based at Wembley).

SYSTEMS PRE-SALES SUPPORT ANALYSTS. ANALYSTS/PROGRAMMERS.
SOFTWARE PROGRAMMERS (mainly located at Wembley, with a few vacancies at Lichfield).

JOIN VENTEK Dynamic expansion by the acknowledged leaders in distributed data *processing* opens up outstanding career opportunities for real computer professionals.

ABOUT VENTEK Sales of the outstandingly successful DATAPOINT range of computers (over 1,500 systems have already been installed) continue to expand.

Now, following the recent introduction of ARC—a revolutionary new concept expanding computer capability—Ventek has further reinforced its leadership of the distributed data processing market in the United Kingdom.

As a result, Ventek requires still more first rate professionals to join their young and enthusiastic team.

MEET VENTEK Ventek offers a challenging and rewarding career with big company benefits for people of outstanding ability and drive.

APPLY NOW Take your career a great step forward and get in touch with us now for an application form. Or, if you prefer, we can arrange an immediate and informal interview.

CONTACT Frank Knight, Personnel Department, Ventek Limited, Station House, Harrow Road, Wembley, Middlesex HA9 6ER. Telephone: 01-903 6261.

TAKE A GREAT STEP FORWARD AND JOIN VENTEK.

Ventek Limited,
Station House, Harrow Road,
Wembley, Middlesex HA9 6ER.
Telephone: 01-903 6261.

SENIOR SYSTEMS ANALYST & SYSTEMS ANALYSTS

We'll lay on a great welcome for you

North Thames Gas is developing a Customer Service computer system to achieve further improvement in the standard of service to our customers. We attach great importance to this project, and the people who make it a working reality will be highly valued. It is a real-time system running on Data General C330 minicomputers, with over 60 V.D.U.s and we are now looking for a SENIOR SYSTEMS ANALYST.

You will need at least 2-3 years' successful experience in implementing systems in a commercial environment, ideally including experience of the design of software in collaboration with software programmers. You will be responsible for the definition of system requirements in liaison with user staff at all levels, and for supervising a small team of Systems Analysts designing, specifying and testing the required system.

We also need a number of SYSTEMS ANALYSTS with a background in programming involving at least one year's experience in a commercial systems environment. If you wish to widen your systems experience then a career with North Thames Gas would be a wise move.

THE BENEFITS

The Development Centre for this system is in a pleasant building in Acton, West London, easily accessible by most forms of transport, and has free car parking nearby.

The salary range is £5553 to £7074 for the SSA and £5133-£6537 for the SA's and starting salaries will depend on experience. The many additional benefits include 25 days holiday entitlement, a first-rate social club and sports facilities which include squash courts, tennis and football.

This could be a very positive step forward in your career. **We would welcome a call from you.** Make the first move by telephoning Richard Toombes, Systems Manager, Minicomputers, on 01-933 0914, for an exploratory talk; or ask our Recruitment and Selection Officer on Staines (81) 61666, extension 3282 for an application form; alternatively write to him in sufficient detail to make an application form unnecessary at: North Thames Gas, North Thames House, London Road, Staines, Middx. TW18 4AE. Please quote ref. E9108 for the SSA and E9082 for the SA positions.

NORTH THAMES GAS

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

FIELD SERVICE ENGINEERS

SALARY PACKAGE: To £6,500 package + Car + Radio Telephone.
AREA: Manchester to cover Northwest area from home
Darlington to cover Teeside and Tyneside from home.
EXPERIENCE: Practical experience of electronics or computer systems in industrial/commercial environments is required.
OPPORTUNITY: The U.K. Division of this multi-million dollar American company is small but established, and with sales at an unprecedented high, they expect to double in size within five years. Thus career progression is virtually guaranteed.
TRAINING: Full training will be provided at the company's European Training School on a regular basis.
FORWARD-LOOKING COMPANY: The company manufacture powerful mini and micro computers for industrial/commercial use. Their success has resulted in over 18,000 systems installed worldwide. Always at the forefront of technological advances, their activities are constantly highlighted in the International and Trade press.
SPECIAL BENEFITS: Free BUPA, Free Life Assurance, Contributory Pension Scheme (5% of salary), 20 days' Holiday p.a.

For positive career advancement, contact Peter Gorton.

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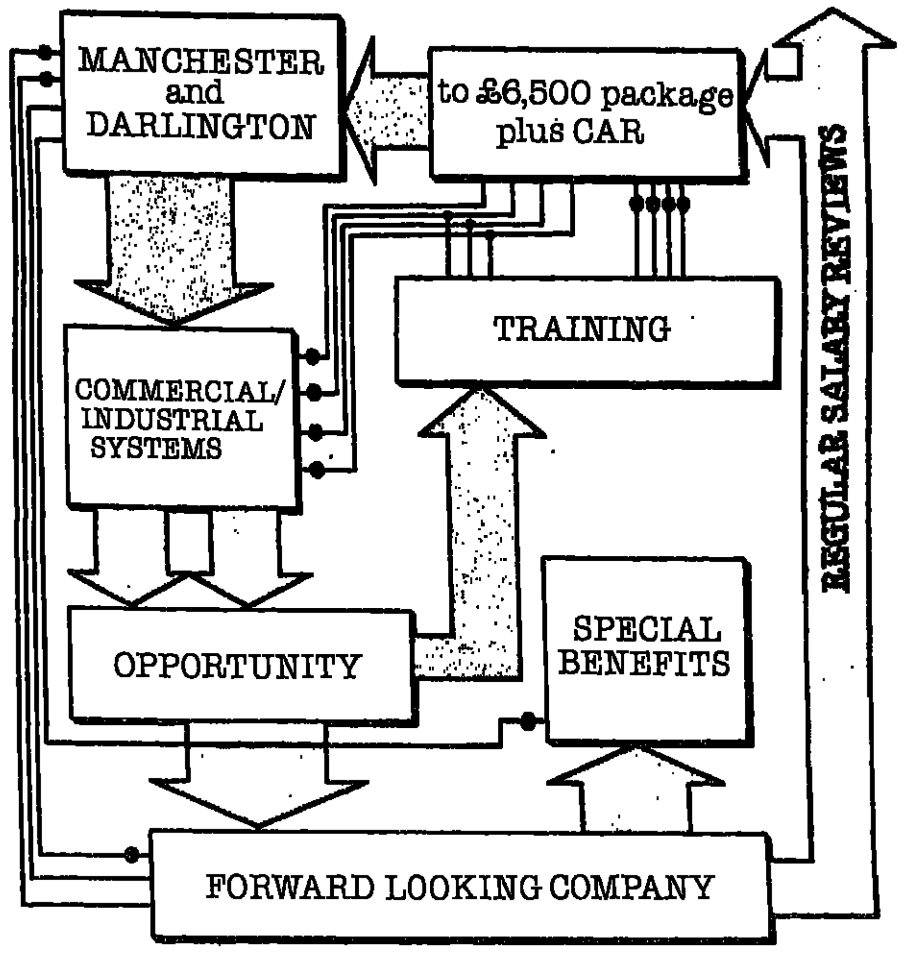
MANAGEMENT & EXECUTIVE SELECTION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Shell U.K. Ltd. at Wythenshawe, near Manchester, require experienced technical staff to work on two large IBM/370 158s running under MVS/JES2 supporting an ambitious program of development for RJE, ROSCOE, RACF, VTAM/NCP, IMS DB/DC services.

HEAD OF THE IBM/MVS SOFTWARE SUPPORT GROUP

You will have at least five years' proven technical and administrative ability with large IBM system software and online systems. You will have a strong sense of commitment and responsibility, experience in the management of technical systems, projects and staff.

You will be responsible for the management and support of the systems software and budgets and have a strong role in developing software and hardware plans.

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You will have at least two years' experience as a systems programmer, software support programmer, or hardware specialist on large IBM configurations, with a proven ability to assume responsibility for the implementation and support for areas within your technical speciality.

We offer excellent prospects for the future together with a competitive salary commensurate with the position plus the usual fringe benefits you would expect from a large organisation. Substantial relocation expenses will also be paid where applicable.

Male/female applicants should write for an application form to:

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Rowlandsway
Wythenshawe
MANCHESTER M22 5SR
Tel. 061-499 4464

Shell

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then consider

OPERATIONS SUPPORT

in Croydon

£4,500 to £5,500

Are you currently a senior operator or shift leader with three years operating experience gained in an IBM 370 DOS environment?

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A large international company successfully installed earlier this year an IBM 370 mainframe in a purpose built data centre in Croydon. Running under DOS/VS and POWER/VS both batch and on-line work is processed.

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In addition to a good start salary, benefits include a non-contributory pension and free life assurance.

The company is well known to us here at Capp Associates and we have no hesitation in recommending the friendly working environment to interested applicants.

For further details contact our CROYDON office quoting ref: CW 35-8S.

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS **CAPP ASSOCIATES** Computing Services Association
19 PARK STREET, CROYDON CR9 1TN 01-686 9693

THE UNIVERSITY OF LANCASTER

COMPUTER SERVICES DEPARTMENT

APPLICATIONS PROGRAMMER

A vacancy has occurred in the User Services Section for a programmer to develop and advise on Applications Software for users in the North West Universities Network. A Degree or equivalent qualification is required and preferably some experience of computing in a research environment, possibly as a user. Salary on the scale £3883-[illegible].

Further particulars may be obtained (quoting reference L.56/A) from the Establishment Officer, University House, Lancaster, LA1 4YW, to whom applications (6 copies) naming three referees, should be sent not later than 23 October 1978.

THE APPLETON LABORATORY HAS A VACANCY FOR A

JUNIOR SYSTEMS PROGRAMMER

To work on real time software projects at the Laboratory's satellite control centre, primarily to work on the software support for the infra red astronomy satellite (IRAS), a major collaborative project involving the United States, the United Kingdom and the Netherlands. The satellite is due to be launched in 1981.

The control centre uses several PDP8 and PDP11 computers for satellite control and data reception. Applications are invited from computer scientists and mathematicians or physicists with an interest in computer science.

Salary is on the Scientific Officer scale £2939 to £4415 p.a., the exact step depending on qualifications and experience. In addition there is an Outer London weighting allowance of £275 p.a.

Noncontributory pension scheme.

Please request an application form from:

The Secretary
Science Research Council
Appleton Laboratory, Ditton Park, Slough SL3 9JX
Tel. Slough 44234 ext. 153

Closing date 19 October, 1978

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

3-5 YEARS' PROGRAMMING

CENTRAL LONDON **c £5500**

We are currently seeking FOUR PROGRAMMERS (preferably COBOL) who wish to progress their careers in a small data processing department based in Central London. Applicants will have 3-5 years' experience and should be prepared to accept team leader responsibilities on certain projects. Knowledge of financial systems and/or modular programming techniques will be an advantage but primarily we are looking for enthusiastic personalities, able to respond to different situations as they arise.

The Company will provide full training facilities as it is envisaged the successful candidates will progress to PROJECT LEADER status in due course. Several systems are awaiting development and it is the responsibility of the programming division to produce program specifications along with system testing procedures.

Working conditions and employee benefits are in line with major organisations operating in the city.

Ref. N1/0510

PROGRAMMERS

SLOUGH **To £5000**

Our Client, a busy engineering company, is currently developing several on-line real-time applications.

If you would like

- ★ To receive training in advanced IBM software
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- ★ Work on a variety of applications projects
- ★ Five weeks' holiday a year
- ★ Excellent starting salary and conditions of employment
- ★ To join an active sports and social club

—and you have a minimum of 12 months' COBOL programming experience, then this could be a good opportunity to accelerate your career.

Ref. W1/0510

PROGRAMMERS TO PROJECT LEADERS

C. LONDON **£4500-£7500**

Additional qualified staff are required at all levels to enhance our clients technical capacity and ensure that the full potential of their future is realised

The development of financial and manufacturing systems will provide a challenging environment for enthusiastic applicants, and aid them in establishing a broad background from which to further develop their careers

At the most junior levels a minimum of one year's COBOL programming experience, gained working on any machine, is sought The successful candidates will be given opportunities to extend and enhance their programming ability and to gain experience in systems design and implementation

The most senior positions require at least six years' experience covering programming and systems analysis, with responsibility for one or more complete systems.

The rewards for joining this progressive organisation are high both financially and in terms of experience gained. Successful candidates can therefore look forward to a truly beneficial career move.

Ref W2/05-10

PROGRAMMERS

S.E. LONDON **£5500 neg.**

We are seeking COBOL programmers with between eighteen months' and two years' experience to join the expanding computer division of a company in South East London.

The successful candidates will be engaged on the development of commercial applications and will have the opportunity to gain analysis involvement progressing eventually to a more senior analysis and management position

The company are committed to more advanced hardware which will be installed in the early part of next year. They are prepared to offer a competitive salary negotiable depending on the level of experience but likely to be in the region of the figure quoted above.

Ref E1/0510

24-hour answering service
Please telephone for a confidential discussion or write to
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MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

CUSTOMER ENGINEERS

Aberdeen & Edinburgh **£5-£7.5K package**

Recent successful tenders for new contracts make it necessary for our client — a well-known computer and telemetry systems manufacturer — to expand his teams of engineers in these two areas.

Aberdeen: For land based systems in Aberdeen and the Shetlands. Applicants will also be required offshore occasionally, and if necessary, on a regular basis. Earnings will be £6000 Basic salary + £300-£1500 in offshore allowances —dependent on the time spent offshore.

Edinburgh: For land based systems throughout Scotland (excepting Aberdeen and the Shetlands) Earnings consist of a minimum £4100 Basic salary + O.T. + Travel Allowances + Shift Allowances (where applicable) + Use of Company Car.

Successful candidates can expect a comprehensive and thorough training, and a stimulating environment.

As you would expect, there are many company benefits, and generous relocation allowances are also available

For positive career advancement -- contact Peter Gorton

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MANAGEMENT & EXECUTIVE SELECTION

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261 8097
or
Mark Williams on
261 8019
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Ref: H3D010

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Due to internal promotion a vacancy has now arisen within the Middleware Group for a Data Administrator to be responsible for the design and administration of the Authority's data base systems

Applicants should have considerable experience of data administration and data base design, preferably using a Codasyl DBMS

The Authority offers excellent conditions of service and generous removal expenses if relocation is necessary.

If you are interested or want to know more about this opportunity, why not call Jenny Spencer at Huntingdon (0480) 56181 Ext. 370 for information and an application form.

The closing date for application is 20th October, 1978 and should be sent to:

ANGLIAN WATER AUTHORITY
Diploma House, Grammar School Walk, Huntingdon, Cambs.

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£6,000 + Overtime + Standby + Car + Training

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These are a few of our more urgent requirements for contactors. For further details of these or any of the many other opportunities contact SARA SMITH on WEYBRIDGE 40989 or the number above.

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You will now realise that the man or woman appointed must have considerable initiative (we do not have the time to show you the way every time a problem arises), and sufficient enthusiasm to inject non-computer people with a real desire to develop and maintain computer systems.

The successful candidate is likely to have a sound basic education and formal computer training.

Application forms, etc.

Please send S.A.E. for application form to:
Chief Administrative Officer
Comprehensive Housing Service
13/27 Station Road, Wood Green, N22

Applications returnable by 20th October, 1978.

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If you are thinking of doing contract work why not start here by registering now for immediate and forthcoming requirements.

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RENDECK LIMITED
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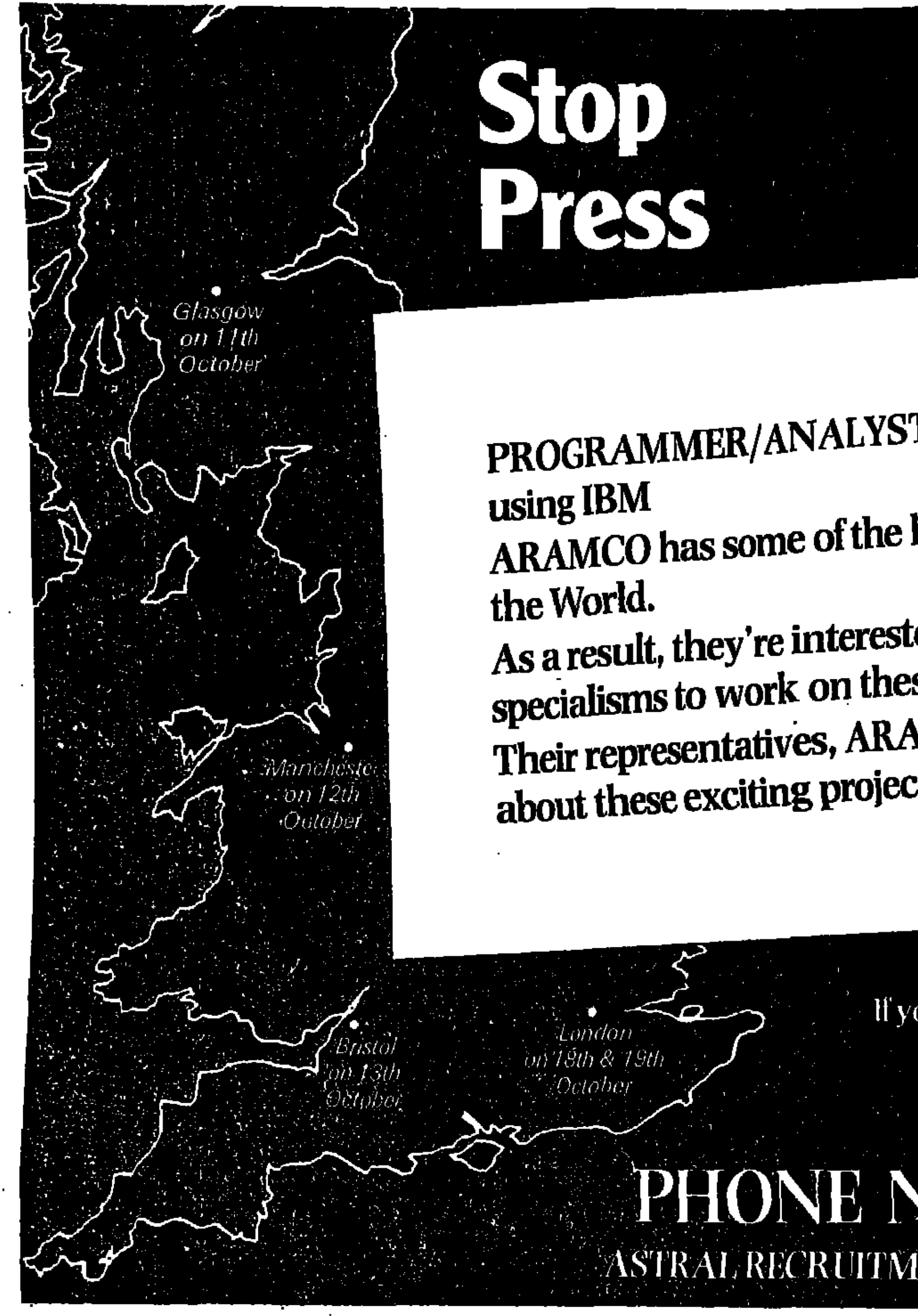

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COMPUTER CENTRE — BARKING

Senior Operator AP2

Required to control the flow of work through the computer in accordance with standard procedures. Applicants must be educated to 'O' level standard and preferably have some experience of ICL 1900 series computers. The successful applicant will be expected to work night shifts on a regular basis.

Inclusive annual salary will range from £4 330 to £4784.48 depending on age, qualifications and experience. *(Ref A 609/78)*

Shift Leader AP3/4

Required for a supervisory position in our Computer Centre. Duties will include assignment of staff duties to ensure overall schedules and training of staff working in shifts. The successful candidate will be expected to work night shifts on a regular basis and should have substantial experience working with ICL 1900 series computers.

Inclusive annual salary will range from £4882 to £5982 depending on age, qualifications and experience. *(Ref. A 610/78)*

Computer Assistant C1/AP2

An opportunity exists within the Polytechnic for those wishing to embark upon a career in computing. Candidates will normally be expected to possess 'O' levels and have an aptitude for practical work. Applicants will be expected to work night shifts on a regular basis.

Inclusive salary will range from £4882 to £5982 depending on age, qualifications and experience. *(Ref. A.611/78)*

Senior Technician T3/4

Required to supervise the day-to-day running of the microprocessor workshop within the Computer Centre. Candidates should normally have attained an HNC or equivalent but consideration will be given to those who do not have such formal qualifications but possess some relevant experience. No shift work is involved. Inclusive annual salary ranges from £4017 to £4917. *Ref. A.612/78)*

For an application form and further details please contact the Personnel Office, 109 The Grove, Stratford, London E15. Tel. 01-555 0811 x 32. Please quote appropriate reference number.

Closing date: 16th October, 1978

Unless otherwise stated, applications for these posts are invited equally from men and women.

NELP North East London Polytechnic

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Find out more about our new 8040 processor and the rewarding career opportunities on offer with CTL. The interviews, like our management style, are designed to be friendly and informal.

Call in and see us. If you can't make it, please write or telephone for further information, quoting ref. FY/134, to Jill McDavitt, Personnel Manager, CTL, Eaton Road, Hemel Hempstead, Herts. Tel: Hemel Hempstead (0442) 3272.

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Qualified professionals with outstanding technical, administrative and commercial abilities will find this a challenging and diversified career opportunity in the fast-expanding field of computer aided design and manufacture.

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MR STEVEN GRELLER, VICE PRESIDENT
LAMBDA TECHNOLOGY INCORPORATED
BOX 1985 Computer Weekly, Room 119, Dorset House, Stamford St., SE1 9LU.

We would appreciate receiving your resume as soon as possible so that we may arrange an interview date. We will be talking to applicants in London during the third week in November.

INSTITUTE OF HYDROLOGY

The Institute of Hydrology Wallingford have a vacancy at SO/HSO level for a

PROGRAMMER/ANALYST

to give assistance to the Institute's scientists who are working on a wide range of hydrological projects. The Institute operates a UNIVAC 1108 and PDP8 and PDP8a Computers and is applying microprocessor techniques to the development of hydrological instrumentation. The Univac has 262k of memory, 4 magnetic tape drives and 240 MB of disc storage and supports both batch and demand work. Twenty terminals are in use both on site and at other institutes. The organisation of computing services in NERC is under review and it is possible that the post will be part of the NERC computing service. The successful candidate will be expected to give assistance with all stages of scientific staff's computing needs, from planning to final data storage and analysis, and also to do some applications work.

Qualifications
Under age 30 with a good degree or equivalent in Mathematics, computer science or other science subjects. A sound knowledge of FORTRAN is essential and assembly language expertise and experience with UNIVAC 1100 or IBM 360 Series would be an advantage.

Salary and Conditions
The appointment will be to the Scientific Officer or Higher Scientific Officer grade. Starting salary will depend on age and experience but will be within the following scales

Scientific Officer £2839-£4416, 20 days' paid annual leave in all cases
Higher Scientific Officer £4101-£5448, 22 days paid annual leave in all cases

There is a non-contributory superannuation scheme.

Staff of the NERC are not Civil Servants but their pay and conditions of service are similar to those of the Civil Service.

The Institute is situated in pleasant rural surroundings and has a staff restaurant, an active sports and social club and a flexible working hours scheme. Write for application forms quoting reference E2/1/104 to

Institute of Hydrology
Maclean Building
Crowmarsh Gifford
Wallingford
Oxon OX10 8BB

Closing date for applications 2nd November 1978

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Circa £6,000

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ATA COMPUTER RECRUITMENT, 230 GREAT PORTLAND STREET, LONDON W1N 5HG

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PROJECT LEADER, at least 5 years in IBM systems, specialising in financial applications. Area Birmingham. Salary to 7K. Ref. SA185

PROJECT LEADER, at least 4 years' experience, specialising in financial systems batch and interactive. Area Staffs. Salary C. 5.5K

SYSTEMS CONSULTANT required by group headquarters to investigate all aspects of group company systems. Several years' experience in systems required plus a degree or professional qualification. Area Staffs. Salary C. 5.5K. Ref SA124.

SENIOR SYSTEMS CONSULTANT required by mini computer manufacturer. Candidates must have tele-processing Real Time experience including an Assembler OT PO/1 language, although the position is based in Coventry the successful applicant must be prepared to travel throughout the U.K. and Europe from time to time. Salary to 7K plus company car. Ref SA155.

SENIOR SYSTEMS ADVISOR, at least 4 years' commercial system including knowledge of Cobol or RPG 11. Area Middlesex. Salary C. 6250 plus car expenses. Ref. SA129.

SENIOR SYSTEMS ANALYSTS, 2 years' experience plus systems including IBM Cobol. Database an advantage. Area Wolverhampton. Salary to 5.5K. Ref. SA191.

SENIOR SYSTEMS ANALYSTS, at least 4 years' experience in analysis preferably with DOS or DOS/VS background with knowledge of Production Systems Control. Area Wolverhampton. Salary C. 5K. Ref. SA17.

SENIOR PROCEDURE ANALYSTS, experience in work flow projects essential. Area Gloucestershire. Salary to 6K. Ref. SA190.

SENIOR BUSINESS ANALYST/PROGRAMMER, at least 4 years using IBM COBOL and development of TSD. Area Birmingham. Salary 6½K. Ref. P225.

SYSTEMS ANALYST, 2 years' plus experience using Online and batch systems. Using CRCS/VS & IMS. Area Birmingham. Salary C. 5.5K. Ref. SA09.

SUPPORT ANALYST PROGRAMMER required by established software house specialising in mini computers, 2 years' experience in Basic + or similar language Realtime Applications. Area Nottinghamshire. Salary to 6K. Ref. SA38.

SYSTEMS ANALYST required by International company in the electronics industry. 18 months' + experience on Main Frame or Mini using Realtime Applications. Area Swindon. Salary Around 5.5K. Ref. S069.

SYSTEMS ANALYST, at least 1 years' Systems experience plus a formal COBOL background. Area Leicester. Salary To 5.5K. Ref. SA84.

SYSTEMS ANALYSTS required by engineering group. 18 months plus Systems experience preferably with IBM Hardware. Area Rugby. Salary C. 6K. Ref. SA96.

SYSTEMS ANALYST, at least 18 months in Systems or O&M. Area Grantham. Salary C. 4.7K. Ref. SA99.

SYSTEMS ANALYST, at least 2 years in designing, testing and implementing systems. Degree preferred. Area Birmingham. Salary To 6.5K. Ref. SA1[illegible]

SYSTEMS ANALYST, at least 2 years' Systems experience together with COBOL or a Mini language. Modern offices. Canteen. Flexitime. Area Birmingham. Salary C. 5.5K. Ref. SA128

SYSTEMS ANALYST, 2 years' plus experience with COBOL programming background. Area Northamptonshire. Salary To 6.5K. Ref. SA168

SYSTEMS ANALYST, 2 years plus Systems with ICL double background. Area Telford. Salary 5K. Ref SA188.

SYSTEMS ANALYSTS, at least 2 years' Systems experience. Area Nottingham. Salary. To 7K. Ref. SA169.

SYSTEMS ANALYST, 3 years' + Systems experience, preferably using IBM. Area Hereford. Salary C 6K. Ref. SA187.

SYSTEMS ANALYST, at least 2 years' Systems experience using COBOL. Area Gloucestershire. Salary To 5.8K. Ref. SA142

ANALYST PROGRAMMER, 18 months' experience in Systems and programming using ICL COBOL Batch or Realtime. Area Leicester. Salary C. 5K. Ref. SA132.

ANALYST PROGRAMMER, at least 5 years' experience in COBOL including Systems experience. Mainframe and Mini. Position based in Birmingham but travelling throughout the U.K. would be involved. Salary To 7K. Ref. P366.

ANALYST PROGRAMMER, at least 2 years' Systems experience using IBM. Area Coventry. Salary To 6½K. Ref. SA177.

SENIOR PROGRAMMER/ ANALYST PROGRAMMERS

PROGRAMMER/ANALYST, 2 years' plus COBOL with production control or IMS experience. Area Staffs. Salary C. 4½K. Ref. P125.

PROGRAMMER/ANALYST, at least 2 years plus RPG 11. Area Worcestershire. Salary To 6K. Ref. P342

PROGRAMMER/ANALYST, at least 2 years' experience in COBOL. Area Birmingham. Salary C. 5K. Ref. P369.

SUPPORT PROGRAMMER required by Mainframe manufacturer, at least 18 months in RPG 11 or Assembler language. Area Nottinghamshire. Salary To 5.5K + expenses. Ref. P321.

PROGRAMMERS required by West Midlands software house, at least 2 years' experience in RPG 11 COBOL or Mini language. Salary range 4.7K + expenses. Ref. P367.

SENIOR COBOL PROGRAMMER, at least 3 years' experience using Realtime applications. Knowledge of Order Stock Systems an advantage. Area Leicestershire. Salary To 6.5K. Ref. P362.

SYSTEMS PROGRAMMER, at least 2 years' experience using CICS/VS DO/1. Area Birmingham. Salary C. 5K. Ref. SA185.

PROGRAMMER, at least 12 months plus COBOL. Area Northamptonshire. Salary To 5K. Ref. P[illegible]

PROGRAMMER, at least 18 months COBOL and hardware. Area Coventry. Salary C. 4.5K. Ref. P258.

SENIOR PROGRAMMER, at least 7 years' programming in TOS and Assembler, mainly financial projects. Area Gloucestershire. Salary To 6K. Ref. P368.

PROGRAMMER, 1 year plus RPG 11. Area Redditch. Salary To 5½K. Ref. P365.

PROGRAMMERS with PL/I or Assembler experience. Area Burton-on-Trent. Salary To 5.5K. Ref. P357.

OPERATORS

SHIFT LEADER, at least 2 years operating ICL 1900 using GEORGE II. Some supervisory experience essential. Area Nottinghamshire. Salary 4k plus shift allowance, double-day shift. Ref. OP132.

SNR. COMPUTER OPERATOR, double-day shift. 1 year experience on IBM 370 using DOS/VS. Area Birmingham. Salary 3.5K. Ref. OP129.

SENIOR OPERATOR, 1 year plus UNIVAC experience. Area Birmingham. Salary To 4½K. Ref. OP124.

OPERATOR, at least 1 year operating ICL 2193 or 1900 under George II. Area Northamptonshire. Salary £4,250. Ref. OP122.

COMPUTER OPERATOR, 1 year plus operating ICL 1900 or UNIVAC. Area Coventry. Salary to 3.7K. Ref. OP131.

Contact: Graham Aston, M.E.C.I.
MARTINS COMPUTER SERVICES. First Floor, Western House, Opposite Albany Hotel, Smallbrook Queensway, Birmingham B5 4HQ. telephone 021-643 2111. 24 hour answering service. Evenings and weekends 021-454 0331.

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021 643 2111
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[illegible]

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Al Silva, Personnel Director
Prime International
The Hounslow Centre
Lampton Road, Hounslow, Middlesex

PRIME

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County Treasurer's Department

SYSTEMS ANALYST
(Commercial Project Team)

SYSTEMS ANALYST
(Borough Council Project Team)

Salaries £4,245-£5,568 inclusive of a non-consolidated supplement.

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A minimum of one year's systems experience is desirable and applicants must hold a relevant qualification.

A flexible working hours scheme is currently operating.

The County Council's scheme for the payment of lodging and disturbance allowances and removal expenses will apply. National conditions of service.

Application forms (to be returned by 20 Oct., 78) are obtainable from the County Treasurer, Mid Glamorgan County Council, County Hall, Cardiff.
Canvassing will disqualify.

DATA PREPARATION SUPERVISOR

Salary range: c. £5,500-£6,000 p.a.

We require a supervisor for our data preparation unit, currently located near Paddington, but shortly moving to the West End

The unit processes work for a large number of departments, including payrolls, costs and supplies, for input to the mainframe computers.

We are looking for a person with proven ability to control a large number of staff working to strict deadlines, and having an understanding of data preparation methods and equipment, particularly key to disc. The work is interesting and demanding, involving continuous liaison with client departments, project development teams, and operations personnel. There will be some requirement for working outside normal office hours, including certain weekends and Bank Holidays, for which an appropriate allowance will be paid

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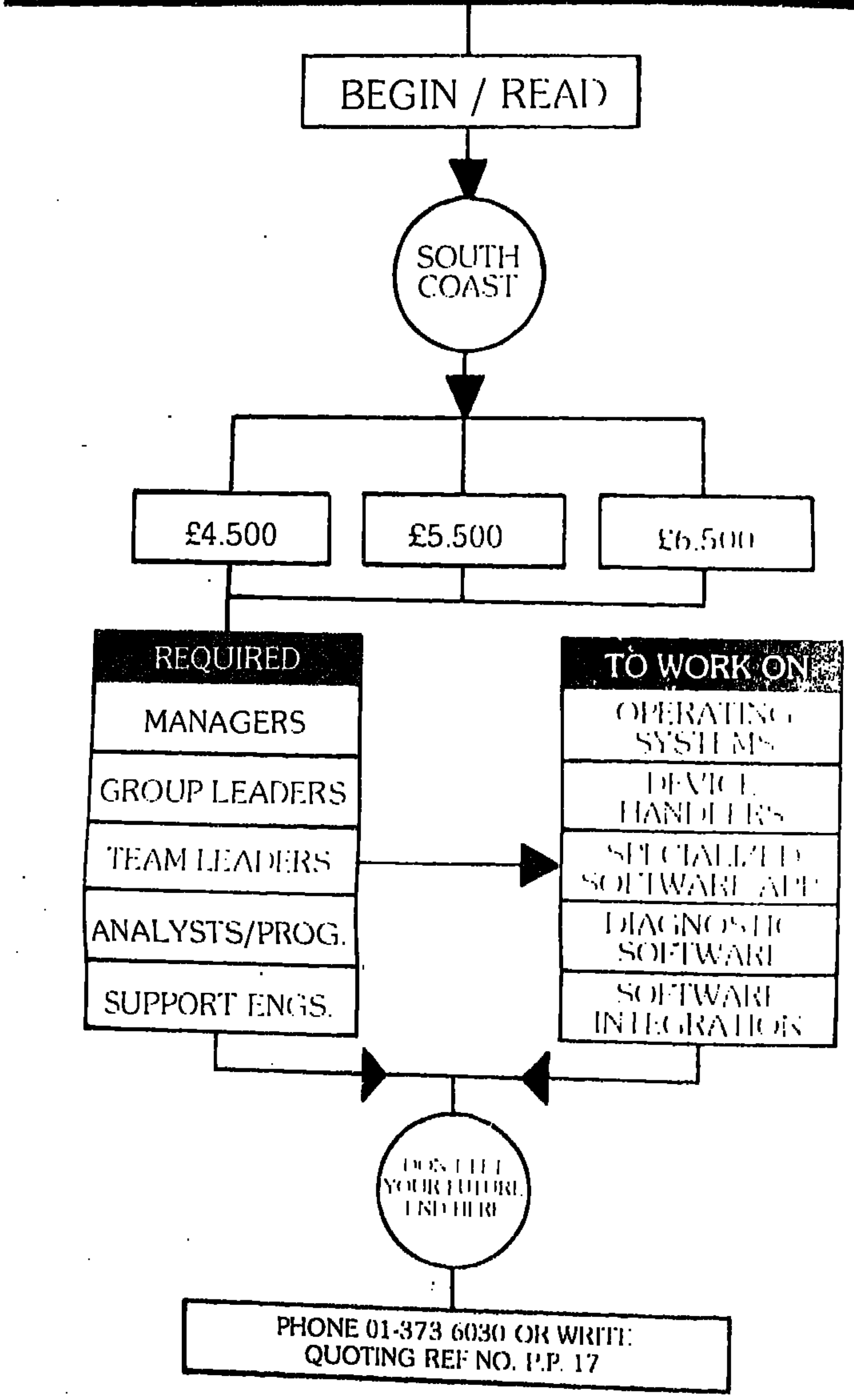

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Thurloe Executive
The Gloucester, 4-18 Harrington Gardens, London, SW7 4LH.
Telephone: 01-373 6030

consultants nationwide

ENGINEERING SPECIALIST (ELECTRONIC)

We are an expanding company in the field of facsimile, call logging and word processing equipment. We now require an electronic/electro-mechanical engineer, preferably with microprocessor and software experience, to be based at our Slough office. The position offers good basic salary, company benefits and company car. Please write to

B. J. Roberts
General Engineering Manager
INTERSCAN COMMUNICATION SYSTEMS LTD.
39 Montrose Avenue, Slough, Berkshire
Tel: Slough 70821

COMPUTER OPERATOR

A Computer Operator is required by the 112 year old Mornington Building Society for their office in Kentish Town.

A new IBM System 3 Computer has just been installed to operate 18,000 accounts and the number is steadily increasing

The salary is generous and there is a non contributory pension scheme/BUPA and 4% mortgage interest rates are available.

Write or telephone
The Manager
Mornington Building Society
158 Kentish Town Road
London NW5 2BT
Telephone: 01-267 2971

University College, London
Programmer/Analysts

FOR LINKED COMPUTER SYSTEMS

Required by the Computer Centre to join project teams developing software for a new service based on several linked GEC 4082 computers. This will gradually replace the existing IBM 360/65 service and provide predominantly keyboard terminal access to a large number of staff and students.

The Centre is seeking experience and interest in operating systems or applications software, particularly the ability to advise on the use of statistical packages.

Candidates should possess a degree or have equivalent experience and salaries will be on one of the [illegible] related scales £3214 to £5282; £3684 to £6170 [illegible] £460 London Allowance

Applications including full curriculum vitae and the names of two referees should be sent to [illegible] Manager, University College London, [illegible] Street, London WC1, or telephone 01-387 [illegible]

PROGRAMMER/ANALYST

W.12 • £5,500+

A subsidiary of an International Multi Billion Assurance Group, have a need for an Analyst/Programmer for their Life and Pensions Company, situated in Shepherds Bush, London

The installation, an IBM System 32 using RPG11, is shortly to be up-graded to a System 34. Present systems are concerned with Administration of Life and Pensions Policies, with the introduction of Financial and Bureau systems being brought in house with the installation of the new Hardware.

Therefore, we are looking for a competent Programmer/Analyst who has at least two years' experience, ideally in Insurance and RPG11, but consideration will be given to other people who are willing to be retrained

You will be given the responsibility of controlling your own systems, reporting directly to the DPM

The Company is at the forefront of expansion, enabling you to join this ground floor opportunity with excellent career prospects
CW40/3

PROGRAMMER AND ANALYST/PROGRAMMERS

£4-7000 p.a. Central London

An international Computer Services company require more people as a consequence of continued growth and success

They are looking for programmers with experience of RPG11. Experience of System 3, 32, 34 and/or financial applications would be an added advantage

You will be offered the opportunity to work on a wide variety of interesting projects plus the possibility of overseas assignments if desired

It is expected that applicants will have ambitions to move into analysis, consultancy or develop their expertise into other programming languages and machines.

These are excellent opportunities in an outward concern where you are encouraged to develop your career and participate in the company's future
CW40-6

PRODUCTION CONTROL ANALYST

Germany to £16,500

An excellent opportunity has arisen in Germany, for someone to design a Production Control package for the commercial applications development of an exciting Mini computer.

The task of designing and specifying the Production Control package will require previous experience of production control systems and the ability to understand the requirement as well as specifying a solution

While the development team will be made up of professionals with relevant software skills, we need a top calibre Production Control individual, who is a self starter and is capable of working on his/her own initiative.

Candidates should have a working knowledge of German, while additional tutorial assistance is available. The post offers a competitive salary in a company that relies on career conscious people for its own growth and development.
CW40/5

DAY-TO-DAY CONTROL FOR COMPUTER FUNCTION

London
up to £6,000 plus fringe benefits

A unique opportunity has arisen for someone who can assist in the rapid development of a group computer service, using ABS Multi-Bus Systems with on-line VDU networks, in the Regents Park area of London.

Our client, an international rental organisation, is looking for a person who will report to the computer manager and be capable of

- ★ Systems Planning (of additional installation)
- ★ *Programming*
- ★ *Day to day* operation and control of existing installation

We would like to hear from people who have the confidence and ability to make a substantial contribution to the growth of this company and its computer operation
CW-40. 1

MOVE INTO SALES RECRUITMENT SALES

We wish to recruit an additional junior consultant to join our small friendly company specialising in recruitment services

The successful applicant will be initially based in Kingston, with a move to the Victoria area planned early next spring

The ideal candidate will probably be currently working in a conventional DP environment with the desire to move into a challenging sales career within the computer industry. The main benefits associated with a small company apply, including identification within the company, responsibility for a wide client base, opportunity to make a significant contribution to the company's success and professional service.

A negotiated salary and commission is paid according to the successful candidate's contribution to the company. Please contact the Managing Director for further discussion.
CW/40/4

SYSTEMS ANALYST

UXBRIDGE up to £6,600

Our client a major Company, who manufactures Flooring and Ceiling Tiles, require a Systems Analyst in their head office in Uxbridge.

The installation, an IBM 370/138, under DOS/VS, Power/VS and CICS is situated in a five storey modern and luxurious office block with its main entrance in the Uxbridge shopping precinct.

The successful applicant, will have 3 years' application programming experience preferably using Cobol, and designed, controlled the development of, and implemented a major computer system

Naturally experience of 370 equipment is a must, and an added advantage would be experience of on-line programming, preferably using CICS

The Company can offer good career prospects with on the job training, subsidised "Penthouse" restaurant. Free life assurance, 4 weeks holiday, and free personal accident cover.
CW/40/8

CAREER DEVELOPMENT IN BERKSHIRE PROGRAMMERS TO MOVE INTO ANALYSIS!

A multi million pound group with controlling interests in a wide range of engineering, production and service functions, is upgrading their 2903 to 2904 next year.

To strengthen the project teams responsible for design and implementation of systems for the various users within this diversified group, we need experienced programmers with exposure to analysis or analyst/programmers who are ready and willing to move into analysis and take up a demanding role in providing the necessary systems for user needs.

The type of applications for development are varied, some will be on-line in addition to Batch mode using Minis for data collection.

O&M experienced candidates will also have a definite place in the systems teams. Prospects are excellent and early promotion to project leadership can be expected. Exceptional candidates can be recruited directly into senior positions.
CW/40/9

Small Business Systems

West London ASSEMBLER £4500-£8300

A major International Systems' House who are better known for their mainframe work, have a fast expanding Small Business Systems Division.

They have an urgent need to recruit people who range from Programmers with 2-3 years' experience, through to Senior Project Leaders.

All you need is experience of ASSEMBLER on any machine, but if you have experience of SYSTEMS DESIGN, REAL-TIME ORDER ENTRY, or ORDER PROCESSING so much the better. Projects are all based on Real-Time APPLICATIONS on the ICL SYSTEM 10 and SINGER 1500 hardware.

Project teams usually consist of 2-3 people, allowing you to follow the project from specification through to implementation.

Salaries are well above market rate and the company can offer excellent career opportunities, Annual Bonus, plus usual Company Benefits one would expect from a company of this size.
Ref. CW/40/2

MINI COMPUTER SYSTEM SOFTWARE

up to £8,000

A Systems Company situated in Southern Surrey requires a Systems Software Consultant, to strengthen their design and implementation capability.

The successful candidate will need

- ★ Five years Mini Computer experience
- ★ Thorough working knowledge of one mini computer real-time operating system (RSX would be an advantage).
- ★ Experience, and ability to make rapid assessment of other operating systems and advise potential users on procedure.

The position is primarily to provide a consultancy within the company, and it will also involve participating in the design and development of new systems.

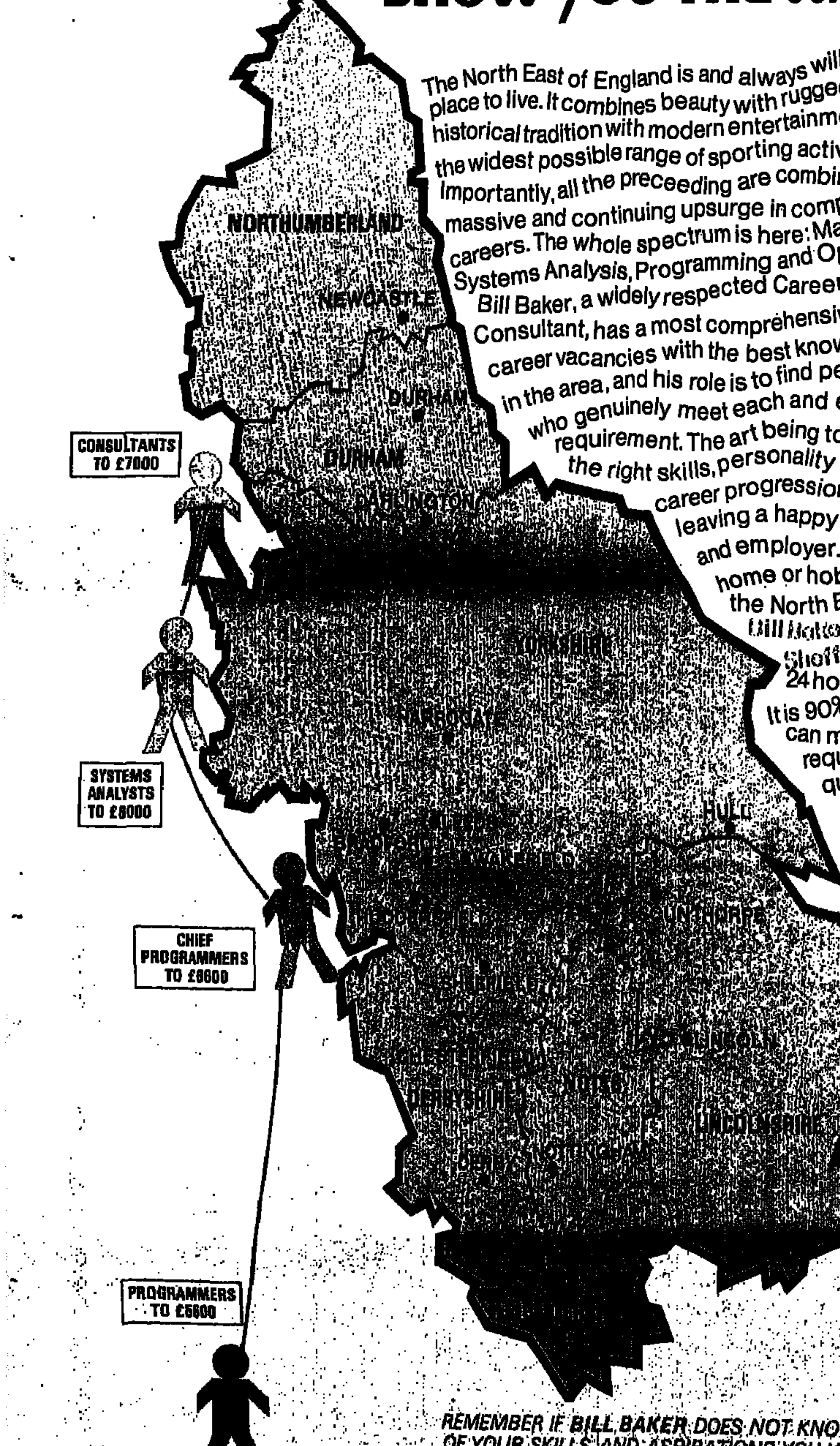
The Company can offer an opportunity for career development in a technical role, as well as Free Life Assurance, Pension Scheme, BUPA, and four weeks' holiday.
CW/40/7

Central Computing Consultants

KINGSTON: 44 Wood Street, Kingston-upon-Thames, Surrey, England. Telephone 01-549 3212. Telex 27950
DUBLIN: Canberra House, 24 Lower Leeson Street, Dublin 2. Telephone 789577 (5 Lines)
[illegible] by the Dept of Employment No. SE(B)170

THERE'S ONLY ONE ROUTE TO THE TOP IN THIS AREA!

LET QUADRANT RECRUITMENT SHOW YOU THE WAY.



The North East of England is and always will be the place to live. It combines beauty with ruggedness, historical tradition with modern entertainment & provides the widest possible range of sporting activities. Importantly, all the preceeding are combined with a massive and continuing upsurge in computing careers. The whole spectrum is here: Management, Systems Analysis, Programming and Operating. Bill Baker, a widely respected Careers Consultant, has a most comprehensive list of career vacancies with the best known companies in the area, and his role is to find people who genuinely meet each and every requirement. The art being to match the right skills, personality and career progression, thus leaving a happy employee and employer. If your heart, home or hobbies lie in the North East ring Bill Baker now on Sheffield 738794 24 hour service. It is 90% certain he can match your requirements quickly.

REMEMBER IF ***BILL BAKER*** *DOES NOT KNOW OF YOUR SKILLS AND ASPIRATIONS YOU WILL NOT GET THE BEST FROM THIS AREA –* ***SO RING NOW,*** *SHEFFIELD (0742) 738794.*

QUADRANT RECRUITMENT LIMITED

Bank House, Queen Street, Sheffield S1 [illegible]
Telephone: 0742 738794 (24 hour service)

Salesman

High Growth Market
Manchester based

We are the rapidly growing DP Division of an established international organisation, designing, manufacturing and marketing our own products. The Company's distributed processing products represent a comprehensive range with the emphasis on intelligent terminals and network processors. The systems offer high quality and value to a wide range of financial, industrial and government users in this rapid growth sector.

We would like to hear from men or women with proven sales experience in the mainframe market who now wish to enter the rapidly expanding distributed intelligence and terminal markets. Naturally, we would be interested in receiving applications from those currently engaged in these market areas who are attracted by our present success and future potential.

Our growth rate is such that we are additionally interested in discussing sales careers with other experienced DP people.

A twelve months' guarantee will be negotiated for this position and in our recent experience, the total earnings potential will provide no disincentive to job acceptance.

Write or ring for an appointment to F. A. Buckingham,
Regional Personnel Manager, British Olivetti Limited
32 Broughton Street, Manchester M8 8[illegible].
Tel: 061-831 7100

olivetti

Consider Olivetti first

Group Systems Manager

The Berec Group require a Group Systems Manager to join their Management Services Department. This vacancy has been caused by an internal promotion within the Department.

Reporting to the Deputy Management Services Manager, the successful candidate will be responsible for assisting user Management in improving direction and control of the organisation, and for directing and justifying computer based systems, including monitoring progress until they are in operation. He/she will have a current establishment of 16 staff and must be prepared to provide techniques and analytical support to his/her section through project leaders. Importance will be attached to applicants being able to apply vigorous project control techniques.

The ideal candidate should be between 30 and 40 years of age with extensive Data Processing experience and a minimum of 5 years in Systems Analysis, and should have a degree/professional qualification. Business experience in a manufacturing concern would be advantageous.

We are currently using an IBM 370/145 and a major upgrade is under review.

Salary is competitive with Company Car and generous benefits including relocation allowance.

Applications giving full details of career, qualifications and current salary should be sent to Alan Holt, Management Recruitment Manager, Berec Group Ltd, Berec House, 1255 High Road, Whetstone, London N20 0EJ

BEREC

A Member of the Berec Group of Companies.

THE SCOTSMAN PUBLICATIONS LIMITED

PROGRAMMER/ ANALYST

£5,500

The publishers of "The Scotsman" and the "Evening News" are currently developing advanced newspaper production and commercial systems.

The production and order entry systems are being developed by a major UK software house to run on a multi-CPU configuration using database techniques and over 40 on-line devices.

In order to prepare for and carry out the initial acceptance and implementation of this major project and to assist in subsequent effective operation of the systems, there is a need to recruit an experienced programmer/analyst who will report to the Computer Services Supervisor.

Applicants for the post should have at least three years systems and programming experience. Familiarity with real time operating systems and Assembler is highly desirable.

Starting salary will be around £5500 and we will assist with removal expenses to the Edinburgh area if necessary.

Applications should be addressed to: **Personnel & Training Officer, The Scotsman Publications Limited, 20 North Bridge, [illegible] EH1 1YT. Tel. 031 225 2466 Ext. 307.**

OPERATIONS SUPPORT POSITIONS

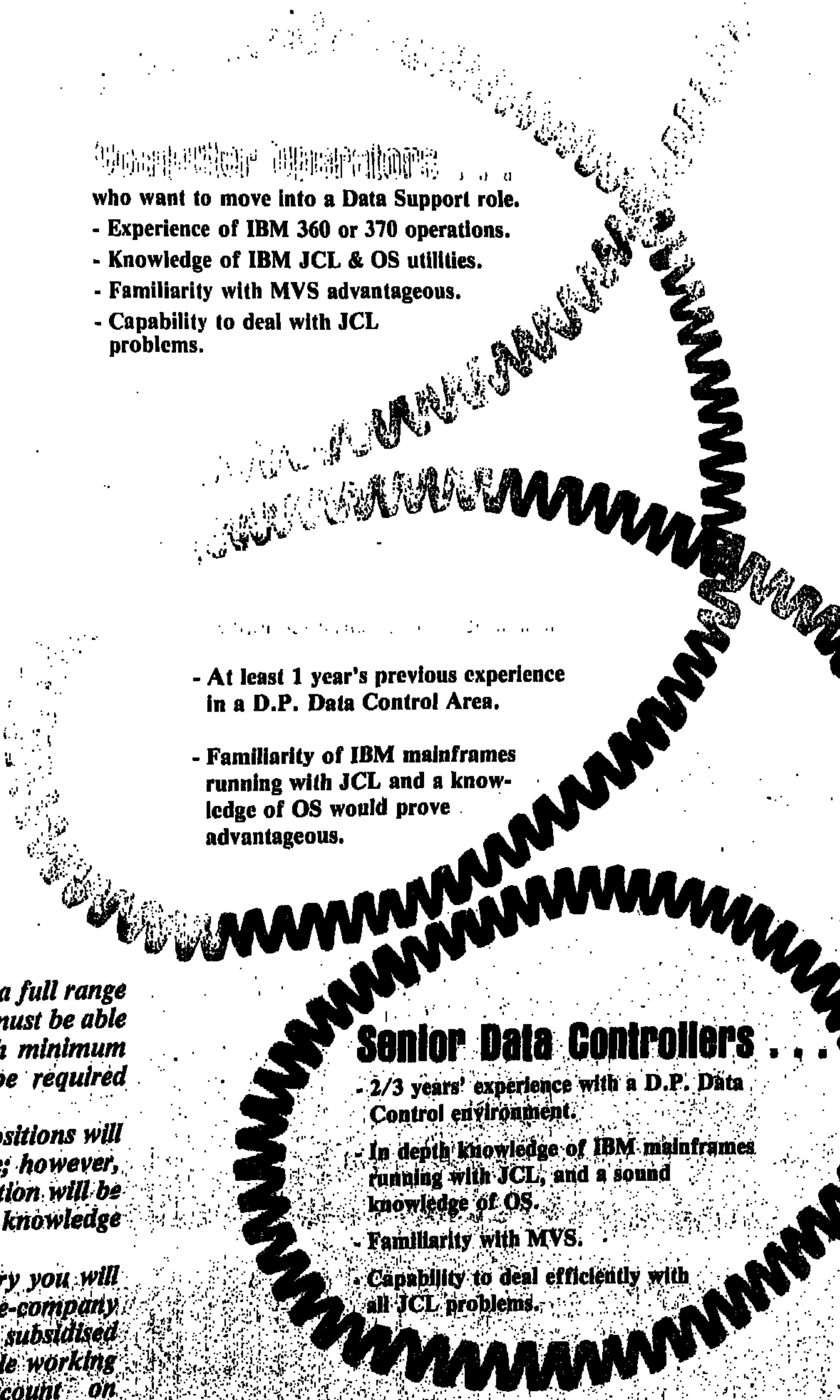
CHALLENGING OPPORTUNITIES WITHIN A D.P. SUPPORT ENVIRONMENT

SALARY RANGE .... EXCELLENT...

The classifications of experience our client is seeking are as follows,-

Our client, a specialist software development centre for a World-Wide Telecommunications Organisation, is now increasing the size of its Computer Centre Operation Teams BASED IN N. LONDON AND N.W. KENT. This recruitment is in preparation for their new 1979 developments which are already in an advanced state of planning.

There are currently four vacancies available, all of which will have an area of responsibility for ensuring the smooth implementation of systems, and liaison between the Computer Centre and various associated companies throughout Europe.



Computer Operators . . .

who want to move into a Data Support role.

- **Experience of IBM 360 or 370 operations.**
- **Knowledge of IBM JCL & OS utilities.**
- **Familiarity with MVS advantageous.**
- **Capability to deal with JCL problems.**

- **At least 1 year's previous experience in a D.P. Data Control Area.**
- **Familiarity of IBM mainframes running with JCL and a knowledge of OS would prove advantageous.**

Senior Data Controllers . . .

- **2/3 years' experience with a D.P. Data Control environment.**
- **In depth knowledge of IBM mainframes running with JCL, and a sound knowledge of OS.**
- **Familiarity with MVS.**
- **Capability to deal efficiently with all JCL problems.**

Since the Operations Team provides a full range of services, all members of the team must be able to work on their own initiative with minimum supervision. Some overtime may be required which will be compensated for.

The responsibility and scope of the positions will depend upon your current experience; however, career prospects are good and promotion will be available once your ability and knowledge develops.

Apart from an excellent starting salary you will also receive all the normal large-company benefits, i.e., 23 days annual leave, subsidised canteen or luncheon vouchers, flexible working hours, Pension Scheme and discount on Company products etc.

If you consider these vacancies could be of interest to you please contact Datascene at once.

Datascene Recruitment Ltd
Sceptre House
169-173 Regent Street
London W1R 7FB

datascene

01-439 7871
24 hour answer phone

PERMANENT APPOINTMENTS

★JOB SATISFACTION ★SALARY ★CAREER OPPORTUNITY

TEAM LEADER — WEST LONDON-BERKS.
to £8,500

International group of companies with its outstanding reputation for efficiency, growth and investment seeks a Team Leader to work on development areas. Ideal applicant will have good technical background in IBM environment. This is a senior position involving project management and quality control of development phases and to assist with the design and specification of the system.

- ★ Good company benefits which include non-contributory pension, life assurance and sickness scheme.
- ★ RELOCATION assistance if required.

Ref 1823

SENIOR PROGRAMMER — HANTS.
to £7,500

Our client, a company based in Hampshire, involved in petrochemicals, seeks a senior programmer with at least three years' experience in COBOL and PL/1. They retain IBM 370 hardware and this position is to work on commercial applications including accounting projects. Ideal applicant will be able to communicate with people at all levels. Company offers excellent promotional prospects.

- ★ Continued development in a well planned schedule.
- ★ FLEXI-TIME and free medical insurance.
- ★ RELOCATION expenses if required.

Ref. 1819

ANALYST PROGRAMMER — CITY
£6,500 + Sub Mortgage

Established merchant bankers has opportunity for person with COBOL and ASSEMBLER or PL/1 to work as an analyst programmer. Ideal applicant will be in mid-20s with a degree and preferably will have worked in a financial environment. CICS would be an advantage but training will be given. This is a super opportunity to follow a good career path.

- ★ Excellent scope to move into systems
- ★ Banking benefits which include low interest loan, and excellent sports and social club

Ref 1716

PROGRAMMER
CITY AND MIDDLESEX
£5,000 neg. + Sub Mortgage

Our client leading bankers, require programmer with at least 18 months' experience in RPG II. Applicant will join a young and enthusiastic data processing team which retains IBM System 3 hardware. Major enhancements are planned to keep pace with company's rapid growth. Applications will be of financial nature and company offers good promotional prospects.

- ★ Excellent fringe benefits which include banking and credit facilities, profit share and non contributory life assurance and pension scheme
- ★ Full banking benefits including bonus

Ref. 1828

PROGRAMMER — CITY
£7,000 + Sub Mortgage

If you have at least three years' BASIC experience on any MINI, a fantastic opportunity awaits you. Our client, a major international merchant bankers, is enlarging its D.P. department. This EXCITING and CHALLENGING position is an excellent opportunity to follow a career path. Ideal applicant would have knowledge of systems, but training offered.

- ★ Good working conditions in a progressive and prestigious company.
- ★ Excellent fringe benefits which include a subsidised restaurant and banking benefits.

Ref. 1801

JUNIOR PROGRAMMER — LONDON
to £6,000

Multinational company retaining large IBM 370 hardware requires programmers with at least 12 months' ASSEMBLER experience to join a highly professional team. They are currently developing a major sophisticated on-line system

Company offers

- ★ Highly progressive organisation.
- ★ Excellent benefits including CHEAP TRAVEL.
- ★ Continued development with a well-planned schedule.
- ★ Good promotional prospects.

Ref. 1764

SYSTEMS ANALYST — CITY
to £7,300

Major British company with assets exceeding £440m seeks persons with minimum 18 months' experience of systems analysis and design covering major aspects of systems work, preferably with an ICL COBOL programming background. Company has a well-planned future including delivery of ICL 2960 computer next year running under VME/B, and covering projected development work

Company can offer

- ★ Excellent early promotion prospects
- ★ Full 2900 training.
- ★ Free staff restaurant
- ★ Flexi hours, season ticket loan, annual bonus, LOW INTEREST MORTGAGES

Ref 1849

SENIOR SYSTEMS ANALYST — CITY
£8,000

Multinational conglomerate company are seeking systems analyst with minimum five years D.P. experience including commercial analysis in an IBM environment, preferably to undertake responsibility for systems analysis, specification and testing of major project phases. Ideal applicant will have CICS/VS and IMS experience but full training will be given

- ★ Super working conditions including free lunch
- ★ Varied projects providing an interesting and absorbing career

Ref 1791

PROGRAMMER — HOLLAND
£11,000

International company manufacturing sophisticated technical products for world-wide distribution seeks a programmer for exciting newly created position. Company have installed PDP-11 using BASIC+ and consequently require person with good knowledge of the same, with a good personality and strong desire to accept a challenge.

- ★ Prestige company with American backing.
- ★ Good deal of development work using integrated database.
- ★ Excellent prospects and early salary review.

Ref. 1742

PROJECT LEADER — CITY
£9,000 - £9,500

Unique opportunity within multi-national communications conglomerate for project leader. A challenging position with responsibility for large team developing major message switch system. Duties will therefore include co-ordination of the team, design of systems and technical guidance to four team leaders. Ideal applicants will have at least five years' experience on PDP, message switch, RSX & RTL II with strong personality and desire to succeed.

- ★ First-class career structure.
- ★ Well organised projects and good working teams.
- ★ Plenty of room for growth and excellent earning potential.

Ref. 1827

PROJECT LEADER—CITY
£7,000 + Sub Mortgage

International financial institution has a vacancy for a project leader to lead a team in a major new system development. Looking for someone with at least 18 months' supervisory experience leading to successful achievement of a significant project preferably in a financial environment. Must have ability to communicate well with all levels of people and able to make and act on decisions. They retain IBM hardware and run under DOS/VS. Continued development in a well planned schedule.

- ★ Scope in a variety of areas
- ★ Progressive organisation
- ★ Good company benefits which include sports and social club.

Ref 1782

CONSULTANT — S. ENGLAND
£8,000 +

World wide manufacturing company based in S. England seeks 2 persons to work in capacity of Systems Engineer on a major airline project involved in development and installation of sophisticated terminals and communications systems. Ideal applicant should either have mini programming experience in ASSEMBLER, BASIC, or MUMPS, and/or current systems house design and application software experience, both in communications and real time in commercial environment

- ★ Fantastic career growth and earning potential
- ★ Opportunity to do some marketing support besides client liaison
- ★ Opportunity for overseas travel

Ref. 1813

For further details ring our London Office 01-734 0152/3010 (24 hours)

Computing Services Association

CONTRACT DIVISION

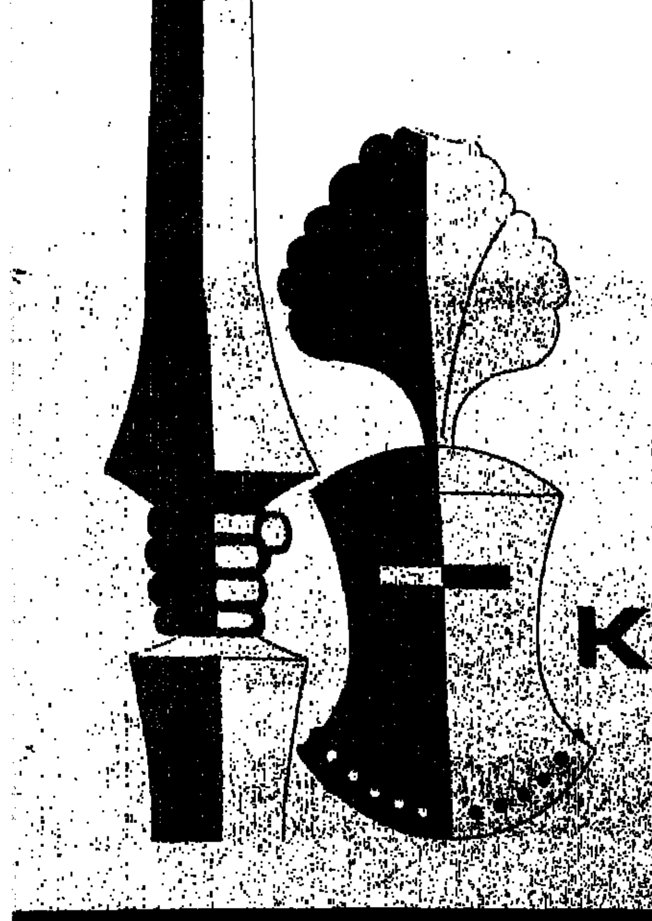
U.K.

PDP FORTRAN	BERKS	£230	IBM SYS 3 RPG II	MIDDX	£200+
PDP MACRO II	GLOUS	£220	IBM COBOL/ASSEM MAINT	HERTS	£200+
PDP MACRO II	C. LONDON	£220	IBM COBOL TSO VSAM DOS/VS	C. LONDON	£200+
IBM OS TSO COBOL AN/PROG.	HERTS	£200	ANALYST FORTRAN	C. LONDON	£220+
IBM DOS CICS/ASSEM	S. LONDON	£230	FORTRAN + OS JCL	C. LONDON	£NEG
IBM COBOL + MK IV	C. LONDON	£210+	ANALYST IDMS EXP	C. LONDON	£220
IBM CICS/ASSEM PL/I	CITY	£220+	HONEYWELL 6000 TDS COBOL	MIDDX	£220
IBM IMS DB/DC PL/I	S. COAST	£250			

OVERSEAS

PDP FORTRAN KN. FRENCH	BRUSSELS	£350	IBM SYS PROG 370/158 OS/VS	HOLLAND	£400
PDP MACRO II KN. FRENCH	BRUSSELS	£350	NEAT 3 TO IBM COBOL CONVERSION	HOLLAND	£350
FERRANTI 500 CORAL KN. FRENCH	BRUSSELS	£350	IBM SERIES 1 ASSEMBLER	HOLLAND	£350+
HONEY 64 GCOS 2000 COBOL	HOLLAND	£340			
UNIVAC 1100 DMS	HOLLAND	£375			

For details of the above, and further contracts, ring Christine Kay / Dave Hayton
Tel. No. 01-734 0152 (24 hours)



KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON W1. TELEPHONE 01-734 0152/6 (24 HOURS)
ALSO OFFICES AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

INTERACTIVE COMPUTING
Rutherford Laboratory

The Engineering Board of the Science Research Council is setting up a national Interactive Computing Facility. Based on a network with major nodes at Chilton, Edinburgh and Manchester, the computing equipment includes a twin-processor IBM.360/195, two DEC 10's, a Prime 400, a GEC 4070, a III FR80 colour microfilm recorder and numerous other computers and peripheral devices. Several more multi-user minis will be purchased this year and added to the network

Application Programmers

Graphics Systems Design

A Programmer is required to work on the establishment of general interactive pre and post-processors for a wide range of engineering design tasks. A variety of modern graphics terminal equipment must be handled, including colour raster displays. (VN.733A).

Analogue & Digital Systems

Successful candidates will be engaged on developing new applications software for CAD in Analogue and Digital Systems and extensive work on Micro-Processor Systems is envisaged. The work will include

Establishing and maintaining programs providing a comprehensive digital design system. Areas to be covered range from specification languages through simulation and test generation to placement and routing on both LSI chips and PC Boards. (VN.733B).

Constructing and maintaining a device and materials library for use in conjunction with the analogue and digital design software (VN.733C).

Considerable experience in the relevant disciplines is necessary and appointed staff will be expected to co-operate with University Research workers in making substantial contributions to this field

Finite Elements

To establish a finite element software library suitable for use in advanced research. Substantial experience of finite element techniques is necessary for this post.

We expect the successful applicant to collaborate with University researchers in making major contributions to finite element techniques (VN.733D).

Depending on qualifications and experience, grading and salaries will be as follows:

Scientific Officer	£3,037 — £4,724
Higher Scientific Officer	£4,388 — £5,829
Research Associate (fixed 3 year term)	£5,500 — £8,000

We are prepared to offer accommodation, and the posts are based at the Rutherford Laboratory, Didcot which is situated within pleasant rural surroundings on the Berkshire Downs.

We provide daily travel facilities to most of the neighbouring towns and villages, and *Rutherford* has its own restaurant and recreational facilities, while at the adjoining *AERE Harwell Site*, you can enjoy the full benefits of the shops, banks, sports and social clubs.

Please write for further details and application form, quoting the appropriate reference number to Ruth Jeans of the Personnel Group.

Closing date for applications 20th October

RUTHERFORD
Science Research Council
Rutherford Laboratory, Chilton, Didcot,
Oxfordshire OX11 0QX. Tel Abingdon 21900

SYSTEMS ANALYST

Due to the significant expansion of the Company's manufacturing facilities at Seal Sands, Teesside, the Company require to recruit another Systems Analyst.

The successful applicant will form part of a small group and will be involved initially in the design and implementation of a Materials Management Project.

Candidates should be fully conversant with Fortran and Assembler programming and must have at least 2 years' experience of on-line systems design and programming and have worked in a mini computer environment. Previous experience in inventory computing within the process industries would be an advantage.

The Company offers an excellent salary together with first-class conditions, including non-contributory pension and life assurance schemes. Please write giving brief details of qualifications and career to date to:

Recruitment and Training Supervisor, MONSANTO LIMITED, Seal Sands, P.O. Nox 62, Middlesbrough, Cleveland TS2 1TX. Tel. Seal Sands 546464.

Look to the future with **Monsanto**

LOGISTIX

Data Processing Recruitment Consultants

Programmers Designers Consultants Belgium & Berkshire

Salaries: to £16K (Belgium) to £9K (U.K.)

An internationally renowned supplier of Data-Base and Teleprocessing Management Systems has retained Logistix to identify top calibre Data-Base and Teleprocessing

- * APPLICATIONS PROGRAMMERS
- * SOFTWARE PROGRAMMERS
- * SYSTEMS ANALYSTS
- *CONSULTANTS

for its Belgian Head Office and U.K. Regional operations.

THE COMPANY. Our client has its Corporate Head-Quarters in Ohio, U.S.A. having installed its first product in 1968. To-day its operations are world-wide including **Canada, Europe, South America, Far East and Australia.** Since its inception the Company has successfully served over 200 clients installing on-line and data-base applications, whilst the number of installed products exceeds 5,000. Currently, the Company's head-count exceeds 600 world-wide with a sales turnover of $50 million per annum.

THE PROJECTS. Some of the Company's recent projects have included the following:—

- *Development of Data Base and Real Time Systems and Programming Standards.,
- *Data Base Production Control Systems.
- *Turn-key applications and systems software package development.
- *Conversion of other DB/DC software.
- *Implementation of warehousing distribution systems.

THE PEOPLE. These very important positions will appeal to those who wish to live overseas in a multi-language society **(French/Dutch/English),** or to those who wish to improve their knowledge of French or Dutch (whilst at a later date there may be a limited number of positions available in Frankfurt). Whilst for those who prefer to remain in the U.K. you will have an outstanding opportunity to live and work in one of the most picturesque areas of the Thames Valley. Even then there will be ample opportunity for travel within the U.K. and overseas should it be desired. Technically speaking you must have current experience in the implementation and support of **Data-Base and/or Real-Time systems.** Suitable applicants should therefore offer in-depth **IMS DB/DC** exposure or similar Data-Base experience with an independent suppliers' software.

Our clients are seeking:—

- ***APPLICATIONS/SYSTEMS PROGRAMMERS** with a minimum of 18 months programming experience in COBOL, PL/1 or BAL in a commercial, financial or manufacturing environment.
- ***SYSTEMS DESIGNERS/ANALYSTS** who must have worked in the capacity of either **Project Leader or Project Manager** and have been involved in a feasibility study, the design and subsequent implementation of at least one complete system preferably in the areas of sales **ordering, stock/inventory control, budgeting/forecasting, foreign exchange/investment and portfolio management.**
- ***CONSULTANTS** who must demonstrate multi-hardware and software expertise with either a Manufacturer or Systems House. Particular reference will be paid to those who are expert in the areas of Project Planning, System Analysis and Design, "Top-Down" Development and Structured Programming techniques.

THE BENEFITS. The higher than average salaries reflect the prominence which our client places in the acquisition of these key personnel. Additionally, extensive benefits include full re-location expenses, life and disability insurance, pension and medical plans, overseas allowances and liberal mileage allowances.

FOREIGN ASSIGNMENTS: you will be offered similar terms to the U.K. positions with the additional benefits of "all found" accommodation for both yourself and your family. Where necessary financial assistance towards the cost of French language courses will be given. Willingness to relocate for a meaningfully extended period is therefore a prime criteria in applying for such positions.

THE INTERVIEWS. In the first instance we will conduct initial interviews in our London office, after which candidates will be short listed to meet two of the Company's senior management who will visit our offices in mid October. Offers of employment will be made no later than seven days after interview. It is hoped that for both U.K. and Belgian positions appointments will be taken up in November. Please contact John Staley.

Ref: 28/A

Logistix, Freepost 32, London W1E 3YZ
01 491 4636 **Telex 28800**
(Reverse charges)

LOGISTIX

Avon House, 366 Oxford Street, London W1N 9HA

Systems Analysts

Croydon **To £6,500**

- ★ Positions available at all levels
- ★ Interesting on-line and database projects
- ★ Full training where necessary
- ★ Clear career path
- ★ Secure but expanding organisation
- ★ Developing environment

The installation is the computer services division of a significant financial organisation. A major expansion phase has been entered utilising advanced IBM hardware/software.

The successful applicants will join project teams working on a variety of new and existing systems. Database and on-line techniques will feature heavily in all development and training will be given where necessary. These are excellent opportunities for systems analysts who wish to develop their experience.

Candidates should have a good financial or commercial systems background but IBM knowledge is *not* necessary. Salary will be competitive, benefits include an excellent non-contributory pension scheme and flexitime is operated.

To find out more about these positions, telephone our CROYDON office or write including brief career details and quoting reference: CW 36-8H.

01-686 9693 (24 HOUR ANSAPHONE)
19, PARK STREET, CROYDON, CR9 1TN

061 236 9085 FAULKNER HOUSE,
FAULKNER STREET, MANCHESTER, M1 4YD

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS
CAPP ASSOCIATES
LONDON AND MANCHESTER
Computing Services Association

---

datascene

OPERATIONS

ICL 1900 GIII £4000
GII or Manual experienced required for this City Installation. Perks include Bonus, BUPA and Subsidised mortgage.

ICL 1900 GIII £4300
One year's experience necessary. 3 shifts. 5 days a week.

IBM 360 DOS £5000
Senior ops and Shift Leader required for Central London installation. Senior 18 months + experience Shift Leader 3 years

IBM 360 DOS £4000
Op + Snr Op for progressive manufacturing company Good prospects for early promotion to Shift Leader. 2 Shifts only.

IBM 370 OS £4800
18 months + experience with some JCL knowledge for Central London installation.

IBM SYSTEM 3 £3500
6 months' + experience 3 days per week only. Prospects to learn programming.

BURROUGHS 4700 £5000
Minimum of 2 years experience necessary for this post. 2 shifts limited nights

BURROUGHS 3700 £4600
Snr Op. with 18 mths. experience needed for this job with excellent career path + perks.

NCR CRITERION £4300
Snr. Op. with a minimum of 2 years' experience for this post on NCR's new range. No nights and perks include cheap loan and mortgage.

UNIVAC 1108 £4800
Minimum of 2 years experienced required for major manufacturing company.

Datascene Recruitment Limited
Sceptre House
169-173 Regent Street
London W1R 7FB
01-439 7871
24 hour answer phone

SYSTEMS & PROGRAMMING

SWISS COTTAGE
LONDON, NW3
UP TO £6,500

We are a major company of the National Freight Corporation providing a nationwide collection and delivery service for parcels traffic.

Vacancies currently exist in the Roadline UK Limited Systems team at Group Headquarters, Swiss Cottage, London.

Programmers and Analysts with a minimum of 18 months' experience are invited to join a small team currently implementing various on-line systems. Cobol experience is necessary and knowledge of TDS or IDS would be an advantage. The work is varied and interesting, the equipment a Honeywell 66/40 and a network of terminals located throughout the country.

The salaries are negotiable up to £6,500 p.a. depending on experience and carry the usual range of benefits associated with employment in a large company.

Please contact Phil Meadows in the Personnel Department at

Roadline UK Limited
137 Finchley Road
London NW3 6JB
Tel. 01-586 2211

roadline

PROGRAMMER

SAUDI ARABIA

£10,000-plus

An international group requires a computer programmer/controller for its petrochemical pipework fabrication plant at Shedgum, Saudi Arabia. The works is geared to high volume production, which the computer is programmed to control and monitor.

Assisted by an operator the programmer will be responsible for computer operations and will report directly to the management. This is an excellent opportunity for a man with several years' experience of Technical/Commercial programmers related to works production. A knowledge of Fortran is desirable.

The initial contract is for one year with options to renew. Salary is around £10,290 plus a bonus at the end of each year. Messing and single status accommodation are free. Generous paid leave.

For application form, please telephone or write to F. D. Standish, UK Representative, Arabian Industrial Constructors Company Ltd., c/o A. J. G. Waters Ltd., 8/28 Milton Avenue, Croydon, CR0 2JT. Telephone: 01-689 5521.

Cyngor Sir
DYFED
County Council

Applications are invited for the following post

EDUCATION DEPARTMENT,
Llanelli Technical College

PUNCH LINK OPERATOR

(CFE 7/12)

Grade Tech. 1 £1609-£2967 plus salary supplement.

The successful applicant will work in the Computer Section of the Science and Mathematics Department. Applicants will be expected to be competent to use computer terminals, both on and off line.

The person appointed will be required to assist generally in the work of the department.

Application forms and further particulars are available on receipt of a stamped addressed envelope from the Director of Personnel and Management Services, County Hall, Carmarthen. Closing date: October 19, 1978.

CANVASSING DIRECTLY OR IN- DIRECTLY WILL DISQUALIFY [illegible]

SALEM ENGINEERING COMPANY LIMITED

require

Programmer/ Analyst

For a computer installation currently being developed; knowledge of COBOL would be an advantage; the successful applicant must demonstrate programming ability and experience of mini-computer is essential, since work will be on an Allied Business Systems Multibus computer using the "SIMPLE" development language. The Company is part of a World-wide Organisation. Ideally applicant will be in the approximate age range 23-27 years.

There is an attractive pension scheme and canteen facilities. Salary according to experience.

Further details and application form from:

The Personnel Officer,
Salem Engineering
Company Limited
Milford House
Milford
Derby DE5 [illegible]

KBS Computer Services
RECRUITMENT DIVISION,
State Insurance Building, 14, Dale Street,
Liverpool L2 4TH. TEL: 051-236 7711

K.B.S. Computer Services, a well established Company, whose dynamic ideas and broad sphere of operations are rapidly gaining a first class reputation which is reflected in its growth. Due to a planned expansion, we now require additional top quality staff for our Headquarters in Liverpool and other offices throughout the U.K.

SYSTEMS & PROGRAMMING MANAGER TO £8,000 + COMPANY CAR LONDON

To build and lead a dynamic team of analysts and programmers capable of tackling a wide variety of client assignments. Experience of the software house environment will be an advantage. Personal ambition and tenacity are essential.

REGIONAL GENERAL MANAGERS £8,000 + COMPANY CAR COVENTRY & LEEDS

A Regional General Manager is required in both Coventry and Leeds to control all facets of the business. You must have relevant management experience in the Computer Services industry and be capable of developing the business across all fronts.

RECRUITMENT CONSULTANTS TO £7000 LIVERPOOL & LONDON

We are looking for experienced PROGRAMMERS, SYSTEMS ANALYSTS or SALES people who wish to work as Recruitment Consultants. You must be able to communicate simply and clearly and be able to interview a broad cross section of applicants at all levels. A good general knowledge of hardware and languages is essential.

SYSTEMS ANALYSTS TO £7,500 CARDIFF, LEEDS & LONDON

We require experienced Systems Analysts, who have the ability to pass on their experience to others, to work as LECTURERS on our Systems Courses. Modern techniques, including CCTV are used.

ANALYSTS & PROGRAMMERS TO £6,500 LIVERPOOL & LONDON

If you have a minimum of 3 years Systems or Programming experience using more than one language or machine, then we can offer you a variety of assignments both in house and on site.

SALES EXECUTIVE £7,000 BASIC + COMPANY CAR LIVERPOOL

We are looking for an experienced Sales Executive with a proven track record. You will be directly responsible to the General Manager for selling our services throughout the North West.

COBOL PROGRAMMERS TO £7,000 LIVERPOOL

We require COBOL Programmers, with a minimum of 3 years experience, who wish to work as LECTURERS on our training courses. You must be able to communicate clearly and have in depth knowledge of the language.

The above positions are CAREER OPPORTUNITIES and are unique in offering applicants the chance to join a Company which aims to be the market leader in Recruitment, Training, Systems and Programming and Bureau Services. Conditions of employment are consistent with those of a large Company and carry the usual benefits, i.e. Pension Scheme, L.V.'s etc.

LEICESTER POLYTECHNIC
SCHOOL OF ELECTRONIC & ELECTRICAL ENGINEERING

COMPUTER SYSTEMS ENGINEER

To take charge of the day-to-day operation of a Data General Nova Minicomputer and to assist with the development of a variety of Minicomputer and microprocessor based systems. A degree, HND or HNC in electronic engineering or computer science is required. Some experience of computer techniques is desirable.

The person appointed may be required to attend appropriate training courses. Salary £4773-£6073 per annum.

Further details and application forms available from Staffing Officer, Leicester Polytechnic, P.O. Box 143, Leicester LE1 9BH. Telephone (0533) 50191 Ext. 2301 or 2303.

IBM FREELANCERS WANTED

370	DOS	OS	COBOL
370	OS/VS	IMS	COBOL
370	VS1	MVS	

Programmer and Analysts
Contracts in and around London
Telephone: Jim Taylor on
01-531 9131

MANHATTAN

KNIGHT PROGRAMMING SUPPORT LIMITED

Computing Services Association

CONTRACT MIDLANDS & N. ENGLAND

UNIVAC 1108 ASSEMBLER	c.£225 NORTH WEST	DATABASE DESIGNER	c.£245 NORTH WEST
IMS SYSTEMS ANALYST	c.£250 NORTH WEST	FINANCIAL SYSTEMS ANALYST	c.£250 NORTH WEST
IBM COBOL OS PROGRAMMERS	c.£220 NORTH WEST	DEC 10 SCIENTIFIC APP	c.£240 NORTH
R/T PROGRAMMERS	c.£220 NORTH	HONEYWELL L66 GCOS COBOL	c.£225 NORTH WEST
HONEYWELL L66 IDS/TDS	c.£250 NORTH WEST	HONEYWELL L66 GCOS COBOL	c.£225 MIDLANDS
IBM CICS ASSEMBLER	c.£245 NORTH	IBM CICS COBOL	c.£240 MIDLANDS
IBM CICS ASSEMBLER	c.£245 MIDLANDS	IBM CICS PL/1	c.£240 NORTH
IBM CICS COBOL	c.£240 NORTH	ICL 2900 VMEB/VMEK	c.£230 NORTH EAST
PDP 11/RSX11 PROGRAMMERS	c.£230 NORTH	PDP11 RSX11 PROGRAMMERS	c.£230 MIDLANDS

FOR DETAILS OF THESE AND OTHER CONTRACTS, PLEASE CONTACT PERRY BUTLER

143/144 ROYAL EXCHANGE, MANCHESTER. *TELEPHONE NO. 061-833 9341/3. MIDLANDS 021-236 1794 Extension 223*

A 2M byte ICL 2970 running under the VME B operating system was installed at the Authority's new computer centre in central Bradford earlier this year. It services a major communications network processing a wide range of applications for users at Head Office and the eight Divisions of the Authority.

The successful implementation of the first phase of the Authority's workload now necessitates the introduction of the planned second shift (alternating days and evenings only) and applications are invited from men and women for the following new posts.

SHIFT LEADER (Ref RN 498)
£5133-£5493 p.a. plus 12% Shift Allowance

Applicants should have had several years' relevant supervisory experience at a large installation with communications facilities. Shift Leaders have first line fault diagnosis *responsibility and applicants* will be expected to demon*strate practical knowledge* of a major operating system and communications hardware. Experience of the 2900 and VME/B would be an advantage

COMPUTER OPERATOR (Ref RN 499/RN 501)
£3648-£4038 or £3177-£3528 p.a. plus 12% Shift Allowance

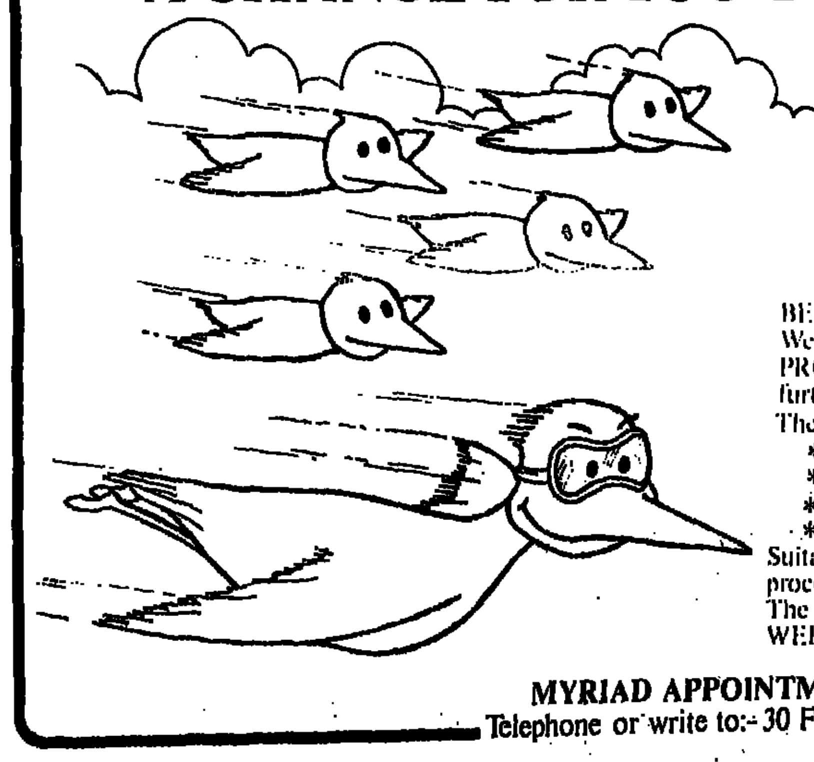
Salary will be dependent upon experience but all applicants for those two posts should have had at least one year's relevant experience at a medium/large installation
Excellent conditions of service include generous relocation expenses and disturbance allowances in approved cases.

For further details and application forms apply to the Regional Personnel Officer, Yorkshire Water Authority, West Riding House, 67 Albion Street, Leeds LS1 5AA. Tel. 448201, Ext. 269.

Yorkshire Water

MYRIAD

A CHANCE FOR YOU TO LEAD THE WAY!



SENIOR ANALYST/PROGRAMMER
(TEAM LEADER)

BERKS/BUCKS BORDER To £6500

We are seeking a SENIOR PROGRAMMER or ANALYST/PROGRAMMER keen to enhance their career by becoming further involved in Systems Analysis and Design.

The position offers:-

- ∗ *Team Leading responsibility*
- ∗ *Systems Design and Development Involvement*
- ∗ *Training in IMS and TP Software Applications*
- ∗ The Opportunity to Gain On-Line Real-Time Experience

Suitable applicants will have at least three years commercial data processing experience with an in depth knowledge of COBOL. The Company offers RELOCATION ASSISTANCE, FIVE WEEKS HOLIDAY and an excellent starting salary.

MYRIAD APPOINTMENTS LIMITED Computer Personnel Consultants
Telephone or write to:- 30 Fleet Street London EC4Y 1AA **01-353 0981 (24 hrs)**

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Are you looking for a job in
BUCKS, BERKS, HANTS, HERTS, MIDDX, OXON, SURREY, WILTS?
are you an
ANALYST, PROGRAMMER or OPERATOR?

If you have been in the computer business as long as we have you will recognise our logo, and know that we provide a personal and confidential career and job search service for you. Our success are the past ten years is directly attributable to this and our policy of selecting companies for candidates and not candidates for companies.

We pride ourselves on the care we take in matching your requirements to the needs of the company with whom we suggest interviews. Our completely individual and personal attention ensures the maximum coverage for you in the least possible time. You are welcome to check the progress of the search whenever you wish or perhaps you simply want to "chew over" your career possibilities. Either way we are always at your service on Reading 54206.

Make the first move now by calling Carolee Yurdin, Ken Rivers, Mike Edgar.

Executive Facilities (Reading) Ltd.
Somerset House, Blagrave Street, Reading
Berks.
Reading (0734) 54206

HIGHLAND HEALTH BOARD
TREASURER'S DEPARTMENT

ANALYST/ PROGRAMMER

Salary Scale: £4,421-£5,326

Applications are invited for the above post in the Computer Services Unit which is situated in the grounds of Hilton Hospital.

The current workload encompasses a variety of financial and medical applications which is processed on an ICL 2904 computer.

Applicants should have at least two years relevant experience and be conversant with ICL Cobol and Software.

Application forms and further particulars may be obtained from and should be returned to the Personnel Officer, Highland Health Board, Reay House, 17 Old Edinburgh Road, Inverness IV2 3HG not later than 27 October 1978.

COMPUTER TWO THOUSAND
217/218
TOTTENHAM CT. RD.
LONDON
W1P 9AF

01-637 3265

IBM TECH. Support c £5250
Large manufacturer's company situated in Essex has a vacancy for Scheduler/Technical Support. The chosen candidate will possess a thorough knowledge of DOS, JCL and Utilities. DAYS ONLY.

IBM OPS. ANALYST £5250
Good knowledge of OS VS1, JCL and utilities required for 370 installation in Central London. DAYS only.

IBM DATA CONTROLLER c. £5000
Required to write JCL, liaise with Systems Dept. and supervise data control, Essex. DAYS only.

IBM SHIFT LEADER £4750
Progressive mid-range 370 installation based in Herts. Applications are invited from intelligent mature people with approx four years' DOS VS experience, three shifts. Good benefits.

IBM OPERATOR £4520
International company with West End based 370/135 under DOS, VS, CICS, two shifts. Prospects into programming and technical support.

IBM OPERATOR £4500
370 installation in Essex requires a DOS VS operator to join a small team. In addition to the above salary, there is an excellent profit sharing scheme and overtime payments.

IBM OPERATORS £4200
Major manufacturing concern based in Kent requires operators for large 370 installation under OS VS1. Applications are welcome from both DOS and OS operators.

IBM OPERATOR £4200
A minimum of 12 months' OS VS1 experience required for major manufacturer's company located in Middx. Excellent prospects for advancement.

IBM OPERATOR £4000+
International company requires 12 months' DOS VS experience for 370/125. Excellent fringe benefits are offered inc. annual bonus, 2 shifts, C. London.

ASSEMBLER PROG. TO £7000
International Co. in S.W. London requires Prog. to maintain systems, packages and develop in house software. Company benefits include relocation expenses.

IBM SENIOR OP. TO £5000
Days only. DOS. S.W. London, this position involves supervising a small young operations team and scheduling computer work load.

JNR. ASSEMBLER PROG. TO £6000
If you have DOS Operations experience plus a knowledge of assembler then this company in South London will train you in systems and software.

IBM OPERATORS £3600
International organisation based in Surrey requires DOS VS operators with six months + experience, for a mid-range IBM 370, three-shift system. Good prospects.

IBM OPERATOR £3500
System 3 operator required for financial concern in North London, 2 shifts. Excellent benefits.

NCR OPS. c £5000
Century operators with approx. two years' B1/2 experience required for financial concern in the city. Exc. fringe benefits.

BURROUGHS OP. £4500
Progressive commercial installation in S.W. Surrey requires MCPV ops. for B3700 machine. Good perks and outstanding prospects.

HONEYWELL OP. £4200
"Multi-National" requires GECOS operator for large city installation. Excellent benefits and superb prospects.

PDP OPS. £3850
Commercial installation in Central London requires PDP-10 ops. for busy environment.

Computing Career Opportunities

We are looking for people with computing experience to join our expanding Commercial Services team at the Division's Headquarters in Welwyn Garden City. We are also currently engaged on a programme of extending the Division's distributed processing activities at its Teesside and other works which provide job opportunities and valuable experience in management and commercial systems.

Present central hardware is IBM 370/155 and 158 [illegible] tly to 3032 using MVS. ROSCOE is available as a development aid [illegible] PL/1 and Informatics Mk IV as our main languages. At the works we hav[illegible] ughs 1700 programmed in COBOL. We require:

Chief Programmer

c.£6,750

To lead the headquarters programming team. Responsible for program design, adherance to standards, testing, quality control and system set up to agreed time scales. Minimum 5 years' experience in PL/1 and JCL in a commercial environment and ability to communicate well at all levels is essential. Knowledge of structured techniques, other languages, MVS, TP and DB will be an advantage. (Ref P245)

Analyst Programmers

c.£6,200

To develop and support existing system areas in accounting and on line distribution, and new areas in real-time accounting and purchasing, production management, information access and data-base management. A minimum of 3 years' technical experience is required based on IBM PL/1 and JCL (or Burroughs COBOL and MCP for the works), and an ability to communicate with users is essential. Some systems analysis experience and knowledge of commercial and/or real-time systems is desirable, as well as education to 'A' level. However a professional qualification or degree would be preferred. (Ref P244)

Programmers

c.£4,500

To work in the headquarters programming team. A minimum of 2 years' experience in PL/1 and JCL is desirable, together with a willingness to learn real-time and data-base techniques and to work to departmental standards. Knowledge of other languages and structured programming etc would be an advantage. (Ref P246)

In addition to the above salaries the Company operates profit sharing and pension schemes, and there is also a quarterly productivity bonus. Working conditions are excellent with good restaurant and recreational facilities. A generous re-location allowance would be given where appropriate. If you are interested please send full details of your experience qualifications and employment to date to Mrs M R Barton, Personnel Department, ICI Plastics Division, Welwyn Garden City, Herts. If you have any queries please telephone Welwyn Garden City 23400 Ext. 3700. An application form will only be necessary for the final selection of likely candidates.

ICI The Leaders in Plastics

Chief Programmer c.7K

The A.P.V. Company Ltd.

APV is a major international process engineering group; we are seeking an experienced person to fill this important computer vacancy at our Crawley organisation headquarters.

The computer department services currently include on-line production control information on a DEC 11/70, batch programs for pay, accounts and costing on ICL System 4 equipment, and computer aided design and graphics on a Prime 400. A Prime 500 computer is also on order.

The Chief Programmer will supervise and schedule programming within the 35 strong computer department, and be responsible for establishing and maintaining programming standards and disciplines.

The ideal applicant would have been programming for six to ten years, and would be fully familiar with several languages including COBOL, with experience of controlling both staff and projects. This post would particularly suit someone from a commercial installation using mainframes, who wishes to broaden their experience of machines and applications and to increase their level of responsibility.

Salary range around £7,000 and a possible relocation package is being offered.

For further details of the job, salary and Company, please contact:

The Personnel Department,
THE A.P.V. CO. LTD.,
P.O. Box 4,
Manor Royal,
Crawley,
Sussex.
Tel: Crawley 27777.

APV

STAFFORDSHIRE COUNTY COUNCIL

Planning Assistant

(Trainee/Assistant Programmer) — Post No. 3002127

Grade AP.1/3 — £2,823-£4,146 per annum (including supplement)

Applications are invited for this post in the Research and Intelligence Unit of the Strategic Planning Division, which deals with the information systems associated with the monitoring and review of Strategic Planning policy in a large and diverse County.

Applicants should preferably possess experience of computer programming and wish to broaden their experience by working on the operation and development of a computer based planning information system. They may also be required to contribute to other related aspects of work in the unit.

Applications (no forms) giving full particulars of age, experience, qualifications, etc., together with the names and addresses of two referees, should reach the County Planning Officer, Martin Street, Stafford ST16 2LE by 18th October, 1978.

Relationship to any member or senior officer of the County Council must be disclosed.

Univac Systems Programmers for Scicon

Scicon Computer Services, based in Milton Keynes, currently operate twin UNIVAC 1108 machines to provide bureau services to a wide range of clients.

Planned hardware expansion for 1979 has created vacancies in our Software Development and Support Group.

Applicants should have experience of OS1100 support/development and be fluent in Assembler.

Scicon currently uses OS1100 Level 33, with extensive modifications to improve performance, security and facilities provided by OS1100 which enables us to operate a successful bureau service.

Salary will be commensurate with experience and ability and is unlikely to be a problem for the right person.

There are the usual staff benefits associated with a Company of our standing, including four weeks holiday and pension scheme.

Telephone or write for application form to [illegible] Personnel Manager, Scicon Computer Services Ltd., Brick Close, Kiln Farm, Milton Keynes, MK11 3EJ. Telephone [illegible]

Scicon

A Member of the BP Group of Companies

Metropolitan Borough of

WIRRAL

Current installation consists of an ICL 1903T running under George 2+ together with 7502 communications equipment.

PRINCIPAL DEVELOPMENT OFFICER (DATABASE) — £5,727-£6,342

Wirral is implementing the first phase of a land and property database, the objective being to provide an integrated information service relating to all land and property. The successful applicant will lead the Computer side and be responsible for implementing and expanding the operational use of the database. This will be a challenging and creative opportunity for a person with a wide knowledge of computer systems and preferably database and/or local authority experience.

ANALYST/PROGRAMMER £4,245-£4,632 or £4,773-£5,073 or £5,232-£5,568

Applications from persons with at least twelve months experience of systems analysis or from experienced programmers with local government or commercial backgrounds and experience of the systems environment.

The successful applicant may expect to be employed upon a wide range of applications, on some occasions working as a member of a team and on others in a more individual capacity. He/she must therefore be capable of negotiating with the representatives of user departments at all levels and of being responsible for a development from investigation through to implementation.

Salary payable will depend on experience and duties allocated.

PROGRAMMER — £3,732-£4,146 or £4,245-£4,632

An experienced COBOL or PLAN programmer is required and knowledge of George and communications work would be an additional advantage.

SOFTWARE PROGRAMMER—£4,245-£4,632

To be involved with the maintenance and development of George 2+, communications work and general software. Experience in one or more of these fields in addition to a COBOL programming background will be an advantage.

Generous assistance will be given with the expenses incurred in moving house in accordance with the Authority's Scheme.

Application forms from the Director of Finance, PO Box 2, Treasury Building, Cleveland Street, Birkenhead, Merseyside (051-647 7000, ext. 340) returnable by 20 October.

TECHNICAL SUPPORT OFFICER

up to £5358

The duties of this post are to supply technical support to the production team, and also the VME/B operating system to be used on the Council's ICL 2980. The job will primarily be to assist the Chief Technical Support Officer in the creation and maintenance of a satisfactory operating environment. At least one year's support experience is required.

Application from from Personnel and Management Services Officer, London Borough of Greenwich, Peggy Middleton House, 50 Woolwich New Road, London SE18 6HQ. Telephone 01-854 8888 Ext. 2119.

Closing date 20th October.

GREENWICH

SCOTTISH SOUTH WESTERN HEALTH BOARDS

SYSTEMS DESIGNER

Salary Scale £4958 to £6025 per annum

PROGRAMMER

Salary Scale £4958 to £6025 per annum

TRAINEE PROGRAMMER

Salary Scale £3452 to £4421 per annum

The ICL 1903T Computer System installed in the Headquarters of the Argyll & Clyde Health Board, Gilmour House, Paisley serves the Argyll & Clyde, Ayrshire & Arran, Dumfries & Galloway and Western Isles Health Boards. The system provides as an integral part of the Information Services Division a wide range of financial services and systems, to produce a comprehensive range of information for Health Care, Planning and Management, are currently being developed.

Applications are invited for the above posts. Application forms and other particulars may be obtained from the Area Personnel Officer, Argyll & Clyde Board, Gilmour House, Paisley PA1 1DU. Telephone 887 0131 Ext. 215 to whom completed applications should be returned not later than Wednesday, 18th October, 1978.

WANTED URGENTLY

Audio interface board for Tektronix 4010 series terminals, parts number 018 0066 01.

Contact: Keith Pike

COMPEDA LTD.,
Compeda House
Walkern Road,
Stevenage
(0438) 56123

YOU'RE THE ONES THAT I WANT!

COBOL—RPG II PL/1 PROGRAMMERS

Call me today — Don't delay
PAMELA at VIP Consultants
Call VIP
CONSULTANTS
01-491 [illegible]

VIP

SYSTEMS RELIABILITY LIMITED

require

SALES EXECUTIVES

Systems Reliability Limited, an established dynamic company involved within the computer industry, are looking to appoint Sales Executives in the South Midlands to enable it to exploit more fully its recent announced telephone monitoring system TEL-TAG and its data network controller NETCOM. Both products are leaders in their application market.

The Sales Executives will operate from our office in Luton, and will cover the whole of the Midlands and North Wales. The successful applicant will already have proven sales experience and knowledge of telecommunications, computing or digital techniques.

We can offer a positive, challenging and rewarding career and are prepared to pay an attractive salary, provide a company car and usual business expenses.

If you feel you have the necessary attributes and are self-motivating, ring or write to

D. J. Whitehead
Sales Manager
SYSTEMS RELIABILITY LIMITED
Marshall House
24-20 Rothesay Road
Luton, Beds. LU1 1QX
Telephone: Luton 38581

D.P. CAREERS in BANKING or INSURANCE

A special recruitment feature spotlighting D.P. Career opportunities in the above sectors will be published in the OCTOBER 19 issue of Computer Weekly. For more details contact

Eddie Farrell on 261-8097
or
Mark Williams on 261 8019

"Du Different"

This rare old Norfolk expression can still hold good if you have the right experience, determination and desire to live in East Anglia. Among the many current opportunities with a difference are

1. **Bureau sales executives** for expanding offshoot of national organisation, with excellent support.
2. **Experienced** IBM 360/370 operators.
3. **Programmers** with two years+ in COBOL, PL-1, BAL or FORTRAN.
4. Systems analysts with PROJECT LEADER potential.
5. Practical implementation of OMAC based stock/production systems needs self-reliant intelligent ICL COBOL programmer willing to work non-standard house in N.E. Essex. (Recent graduates considered.)

For details in confidence ring Bryan Richmond on Norwich (0603) 867233 or leave Ansafone message.

EAST ANGLIAN SYSTEMS LIMITED
P.O. BOX 70, Norwich NR1 4EF
A personalised recruitment service with a difference.

ROYAL OPERA HOUSE

COMPUTER OPERATIONS MANAGER

We are expanding our computer department to allow the existing Data Processing Development Manager to concentrate on systems work and programming. We wish to appoint an Operations Manager to be responsible for supervising and scheduling the work of the ICL 2903/20 computer system and the NCR machines which are being phased out.

RPG 2, ICL 2903/20 job control language and some knowledge of payroll procedures would possibly be an advantage, but it is essential that candidates experience of some aspects of a successful computer installation.

Salary negotiable in the region of £4500 per annum according to experience.

Applications in writing to Personnel Manager, Royal Opera House, Covent Garden, London WC2.

DEPARTMENT OF ENGINEERING

Engineering Analyst/Programmer

Post Ref. E2114 and E2115 (2 posts)
Grade AP4/5
Salary £3933-£4761 plus £312 supplement

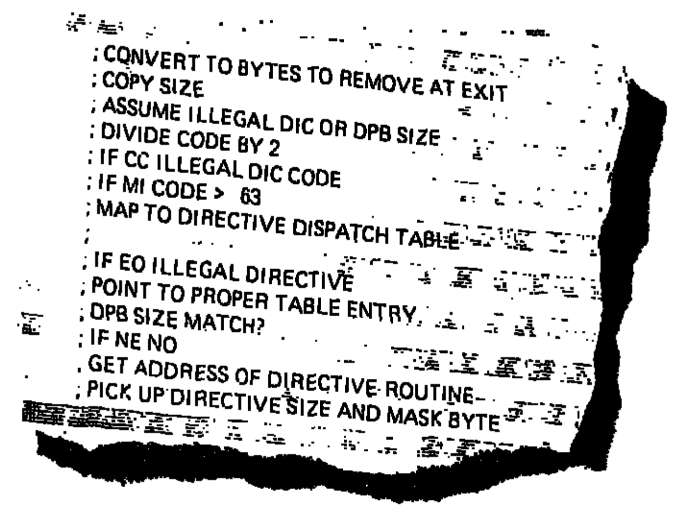
Vacancies exist in the Computer Section of the Department of Engineering, based at County Hall, Barnsley, for two people to work in a small team covering many aspects of civil and traffic engineering. Known future projects include Urban Traffic Control, Highways Information Systems, Highway Design and Graphics. The Department uses the County's ICL 1904S, a PDP based graphics workstation and WANG mini-computers and also accesses bureaux using an intelligent terminal.

Applicants should possess a degree level qualification in a technical subject. Relevant experience would also include FORTRAN and the use of technical packages and knowledge of a non-technical language is desirable.

Please write or telephone for an application form, quoting the appropriate post reference, to the Chief Executive (Personnel), County Hall, Barnsley S70 2TN. Telephone Barnsley (0226) 86141 Ext. 266. Closing date for applications will be Monday, 23rd October, 1978.

South Yorkshire County Council
ENERGY IN ACTION

IF YOU TALK OUR LANGUAGE LET'S TALK BUSINESS



```
; CONVERT TO BYTES TO REMOVE AT EXIT
; COPY SIZE
; ASSUME ILLEGAL DIC OR DPB SIZE
; DIVIDE CODE BY 2
; IF CC ILLEGAL DIC CODE
; IF MI CODE > 63
; MAP TO DIRECTIVE DISPATCH TABLE
;
; IF EQ ILLEGAL DIRECTIVE
; POINT TO PROPER TABLE ENTRY
; DPB SIZE MATCH?
; IF NE NO
; GET ADDRESS OF DIRECTIVE ROUTINE
; PICK UP DIRECTIVE SIZE AND MASK BYTE
```

SENIOR SOFTWARE ENGINEERS £5,000-£8,000

Systime is a major British manufacturer of mini-computer based business systems, with a remarkable track record. It's consistent success ensures a highly stimulating working environment and significant opportunities for staff to extend their experience and income.

The company's development plans require the appointment of SENIOR SOFTWARE ENGINEERS.

A minimum of three years relevant experience is required preferably including a period of working in assembler code at system level. Successful applicants will work in an expanding department and will be responsible for major software developments. These projects will include developments related to operating systems and tele-processing monitors for PDP II's & VAX II's.

Pension and bonus scheme with a company car in some cases. Relocation assistance is available.

Write or telephone to:
IAN McNEILL, Systime Limited
Concourse Computer Centre
432 Dewsbury Road, LEEDS LS11 7DF
Tel. 0532 707411.

SYSTIME

DATA PROCESSING MANAGER, LIMERICK

Salary £8,000

The Company
Neodata Services Limited is a subsidiary of A. C. Nielsen and Company centred in Limerick and with operations at six locations in South West Ireland. We provide a circulation fulfilment service using seven Data General computers (Eclipse S200 and S300), Interfaced to IBM 370/158 systems in the U.S.A. (Upgrading to 3033 in December '78).

The Post
We are looking for a Data Processing Manager who will have full responsibility for computer operations, systems and programming, methods and product development. The person appointed will report directly to the Managing Director and have close liaison with the parent company.

Experience Sought
Project management, Applications Development, and minicomputers IBM 370 — Systems and Operations. Knowledge of magazine fulfilment an advantage.

Salary is negotiable. Fringe benefits are excellent and include the provision of a company car.

Applicants may 'phone or write to one of the following

Frances Downey
Personnel Manager
Neodata Services Limited
Bank House Building
Cecil Street
Limerick
Tel. (061) 49766

Tom McGovern
Joint Managing Director
System Dynamics Limited
72 Merrion Square
Dublin 2
Tel. (01) 764701

£16,000/20,000 p.a.

ICL 2960-2980 expertise IDMS and teleprocessing.

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ICL 2960-2980 application programmers IBM 370 series PL 1 fortran programmers UNIVAC 90/30 90/60 IMS expertise COBOL programmers UNIVAC U1100 TIP and DMS HONEYWELL 66/20 Senior consultant for Algeria, french language required Microprocessors programmers 8080 MITRA 125 Systems programmers and application programmers message switching expertise hardware and software

£10,000 p.a.

ICL 2903 operators.

Call (reverse charge) D. BORREY or Y. HOMPES 322/735.28.19 or 322/649.90.30 or write to (please mention phone number at home and/or work)

CORRELATIVE SYSTEMS INTERNATIONAL
Rue Général Leman 43/45 B-1040 BRUSSELS

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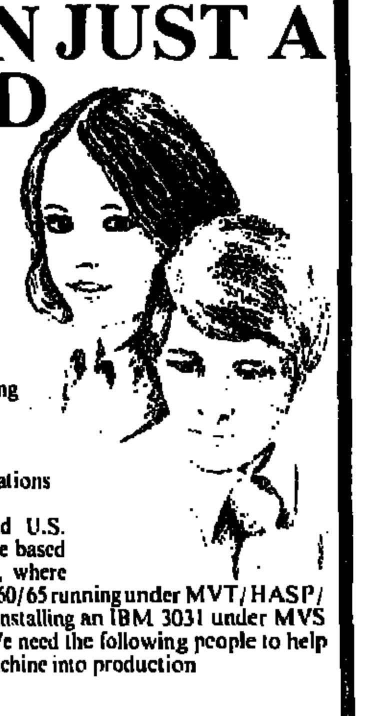

We are one of the largest computer service bureaux in the world supporting batch, RJE and timesharing users with scientific and commercial applications on machines in the U.K., Europe and U.S. In the U.K. we are based at Barnet, Herts., where we have an IBM 360/65 running under MVT/HASP/TSO and will be installing an IBM 3031 under MVS in Spring 1979. We need the following people to help us get our new machine into production

SENIOR OPERATOR	£3090-£4635	PLUS 25% SHIFT ALLOWANCE
OPERATOR	£2600-£3900	

You will be operating large IBM mainframes with extensive communications facilities in a busy bureau environment. Work will be on a 3 shift system Monday to Friday rotating weekly.

Experience of operating IBM equipment preferred.

SENIOR CONTROLLER	£3360-£5040
CONTROLLER	£3090-£4635

You will be responsible for implementation and day to day support of our package users. This will involve customer contact, job setup, quality control and output despatch and liaison with our Sales and Systems and Programming Departments. No shift work is involved.

Experience of IBM JCL and utilities or operating in a large IBM installation preferred but not essential as full training will be given.

MEDIA/SUPPLIES CONTROLLER £2600-£3900

You will be responsible for the maintenance, integrity and security of a tape and disk library of circa 8000 volumes. You will also control stocks of computer supplies such as continuous stationery.

Experience of tape library or inventory control preferred but not essential as full training given.

All vacancies offer attractive career paths within a large dynamic Operations Department. Opportunities also exist for transfer at a later date to other areas of a worldwide organisation dedicated to the computer industry.

For more information on the above vacancies please contact
Jane Marrion
Data Services Division, Control Data Ltd.,
153 East Barnet Road, East Barnet, Herts EN4 8RA.
Tel: 01-440 5161

Magnetic Media Manufacturing Division

CONTROL DATA
MORE THAN A COMPUTER COMPANY

TAYSIDE HEALTH BOARD
COMPUTER DEPARTMENT—BROUGHTY FERRY, DUNDEE

SYSTEMS DESIGNER

Applications are invited for the post of Systems Designer in our Computer Department located at The Bughties, Broughty Ferry, Dundee.

The fields currently being developed include financial, statistical and medical information systems, including on-line working. Equipment is an I.C.L. 1903T (128K) with the usual peripherals run under George 2.

The salary scale is Scale 4, £4421 to £5326, by six annual increments. New entrants to the Health Service normally start at the minimum of the scale. This post is superannuable, canteen facilities are available, and flexible working hours are in operation.

Application forms and further particulars from the Area Personnel Officer, Vernonholme, Riverside, Dundee, with whom applications should be lodged not later than October 31, 1978.

PL1 PROGRAMMERS

West End **to £5500 + Mortgage**

A leading commercial organisation with an expanding 370/135 installation in the West End is seeking a number of PL1 programmers to work on a variety of new and existing projects.

The positions are ideal for enterprising young programmers with at least twelve months experience on IBM Hardware. A knowledge of OS/VS1, although not essential, would be a distinct advantage.

The company offers a first class salary, and the many generous fringe benefits include Flextime, Season Ticket Loans, and a Subsidised Mortgage.

Reference JC 40/1

RPGII PROGRAMMERS

City **to £4500 + Mortgage**

A leading international bank based in the City requires a number of capable programmers to join a team involved in both the expansion of current systems and the development of new projects on their IBM SYS 34.

The company is interested in ambitious young individuals who wish to add to their experience and expertise and who have at least 6 months experience of RPGII programming.

An attractive salary is coupled with a first class benefits package which includes cheap loans and a subsidised mortgage plus all the other advantages normally associated with working for a bank.

Reference JC 40/2

OPERATIONS

ICL 1900 GII **£4000**
GII or Manual experience required for this City Installation. 3 Shifts. Perks include Bonus, BUPA and Subsidised Mortgage.

ICL 1900 GIII **£4300**
One year's experience necessary. 3 Shifts, 5 days a week.

ICL 2900 **£3500**
6 months+ experience required for this travel company. Perks include cheap holidays and flights.

IBM 360 DOS **£4000**
Op + Snr Op for progressive manufacturing company. Good prospects for early promotion to Shift Leader. 2 Shifts only.

IBM 370 OS **£4500**
18 months + experience with some JCL knowledge for Central London installation.

IBM System 3 **£3500**
6 months+ experience. 3 days per week only. Prospects to learn programming

BURROUGHS 4700 **£5000**
Minimum of 2 years experience necessary for this post. 2 Shifts limited nights.

BURROUGHS 3700 **£4600**
Snr Op with 18 mths experience needed for this job with excellent career path + perks.

NCR CRITERION **£4300**
Snr Op with a minimum of 2 years experience for this post on NCR's new range. No nights and perks include cheap loan and mortgage.

UNIVAC 1108 **£4500**
Minimum of 2 years experience required for major manufacturing company.

RECRUITMENT CONSULTANTS

West End **£6500 to £9000+**

We are looking for people with several distinct qualities to join our team of consultants; people with the desire to make money, with a flair for assessing and communicating with others, and with the drive to succeed by sheer hard work.

In return for these qualities Datascene will offer an ideal opportunity to use current DP knowledge in a varied and fulfilling role, working with both clients and our own consultants on all aspects of recruitment.

If you have experience within either Systems & Programming, or Operations, and would like more information, please call Phil Gascoigne.

Reference PG 40/3

COBOL PROGRAMMERS

Kent **up to £5000**

A well established company with strong links to the City of London is seeking additional programming staff for its expanding installation in Kent.

The hardware currently in use is the ICL 1900 range running under GEORGE II and the personnel they require should ideally have a minimum of one year's COBOL experience, preferably on ICL equipment, but other manufacturers' hardware will also be considered.

In addition to an excellent starting salary, dependent only upon ability and experience, the company offers attractive working conditions and a generous benefits package.

Reference JC 40/4

Datascene Recruitment Ltd
Sceptre House
169–173 Regent Street
London W1R 7FB

datascene

01-439 7871
24hour answer phone

JBA

Systems Engineer/Analyst

West of London **neg c £7,500**

Applications are invited from those who can make an immediate contribution in this demanding technical role. To qualify, it is essential that candidates have experience of commercial or manufacturing applications and the ability to demonstrate a thorough knowledge of an ASSEMBLER level language. Specialist skills, such as real-time development on minicomputers will be highly valued. This is a chance to work on possibly the most advanced manufacturing control system outside the USA.

An excellent opportunity for an ambitious and personable technician to join a small but highly professional team. **Contact: Margaret Stevens**

Analyst Programmer

London **c £7,000**

A large international commodity trading organisation with interests in banking and shipping has an opportunity for an experienced d.p. specialist to set up and run a new installation in London.

The company is looking for a person with all-round ability to develop and operate commercial systems on a HP3000. Candidates must have several years experience in a systems and programming environment and be self-motivated to cover all aspects of work in the London Data Centre. This appointment obviously has the potential to offer the senior position as the installation expands.

Salary is negotiable but will not be a limiting factor for the right person.

Contact: Jim Baker

COBOL Programmers

Surrey **Start to £6,900 + BUPA**

Specialising in the provision of conversion services to installations changing or upgrading their hardware, this company requires good COBOL programmers to help them stay on top of the most up-to-date computer technology.

Their Richmond headquarters services both Europe and UK so after initial training you could find yourself spending short periods abroad – supported by generous Tax-Free Allowances on top of your salary. If you enjoy programming, would welcome the chance of travel and variety, and relish the idea of keeping constantly in touch with modern equipment and ideas you may fit into this challenging and exciting environment.

First class training and promotion opportunities relocation expenses and free life and health insurance are some of the substantial benefits available with this company. **Contact: Andy Wright**

Marketing Support Analysts

West of London **up to £7,000 + car**

This company are seeking self motivated analysts, ideally from a communications systems environment who would like to apply their talents to marketing a first class product and offer pre/post sales support

Applicants will be readily considered who have a fairly broad knowledge of the d.p. industry, particularly the terminal systems market. Some background in technical programming and analysis is a definite advantage

Generous salary commensurate with experience is offered and a prestige company car including all private mileage **Contact: Mike Creamer**

Programmer/Analysts

City of London **c £6,250 to start**

A small, specialist city bank has retained JBA to recruit two Programmer/Analysts, who need not have a financial or banking background, to form a team to develop and implement a sophisticated real-time foreign exchange system on their twin PDP11/70's. Essential minimum expertise required is 18 months of MACRO II/ASSEMBLER programming, using RSX-11MM. Design experience is not absolutely necessary at this stage.

The salary package is outstanding with a 2½% mortgage + help with season ticket + 60p L.V.'s per day on top of salary.

Superb opportunity for self-motivated people to forge a career path of their own making, and gain extremely valuable experience. Five weeks holiday and non-contributory pension are included. **Contact: Andy Wright**

Programmers

London **up to £5,000**

A large and well established d.p. department providing computer services to user functions, has a requirement for a number of programmers to work on development and conversion projects for a newly installed ICL 2900.

Applicants should have at least three years experience of COBOL (or PLAN) on an ICL or IBM mainframe. Knowledge of real time, database or transaction processing would be useful. Ability to work without detailed supervision and manage a small group of juniors would lead to more senior positions.

This is a positive opportunity to work on sophisticated applications using up-to-date hardware, software and techniques.

Excellent salaries in a professional environment and non-contributory pension scheme. **Contact: Jim Baker**

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W1. Tel: 01-491 4478

Grow with Telecomputing – nought to a £million in four years
Over 130 users of TPS – the leading software for ICL online systems
Over 60 staff working exclusively on the implementation of online systems on the ICL range

Software Design and Support

1900 2900 VME/B VME/K

Telecomputing continues to develop TPS as the outstanding tp monitor for the ICL range. We are now planning our new software for VME/B, VME/K, and for intelligent terminals. We got it right with TPS – now is the time to join the small team who will develop and support another winner.

Applications Design and Programming

Our client services teams continue to expand to meet the growing demand for our software product and project services. We need more experienced programmers and systems analysts/designers. Junior vacancies require at least one year ICL Cobol experience; in more senior positions your specific computer background is less important. All our work is for online systems but you can learn that after you join us.

Our teams have already implemented applications such as order entry systems, production engineering, stock controls and mail order. More are in the pipeline. There are opportunities at all levels. Continuous training will develop your skills and promote your career growth.

Recruiting Manager

To recruit computer systems and programming staff for Telecomputing and for our clients. All our clients are implementing advanced systems using communications terminals and need the staff to design and develop those systems. We are seeking an experienced computer recruitment officer or someone with general computer experience plus the personal qualities and motivation to handle client recruitment assignments. Flexible hours could be considered provided this includes the ability to interview applicants out of conventional working hours.

Project Managers and Consultants

Must have extensive experience in the design and development of online transaction processing systems.

Telecomputing specialises in implementing advanced systems using communications terminals. We operate internationally with every client bringing his own unique system requirements and we need the senior staff to design and develop those systems.

Lecturer (Commercial D.P.)

To join a small team providing formal training to our clients. We require an established lecturer in computer disciplines or experienced computer programmer with lecturing skills and strong training motivation.

You will not spend all your time lecturing. You will have the opportunity to keep abreast of the latest developments by spending part of your time working with the applications, design and programming staff.

Software Sales

To sell TPS – the leading software product for ICL communications systems. We are currently taking one order every three working days and need additional Sales Staff to respond to the tremendous demand for TPS and other Telecomputing quality software products. Computer experience and sales motivation are essential; experience of terminal systems and of software marketing are useful but not mandatory.

Ideally we would like to meet system designers and programmers who have either moved or wish to move into sales.

◆

Telecomputing started in Oxford in 1974 and has more than doubled in size each year. We are now providing advisory, training and implementation services for installing online computer systems around the world.

We have our own 2904 and a 2950 on order. Our activities are continuing to expand and we shall soon announce a microcomputer display terminal. This year we shall double in size again.

When you join Telecomputing you are taking the opportunity to develop your own career in a growth company. We have an informal atmosphere and expect to pay attractive salaries and bonus.

Please write or phone:
Alan Walker
TELECOMPUTING
Seacourt Tower
West Way, Oxford OX2 0ED
Phone Oxford (0865) 723821 (day)
or Goring-on-Thames (04914) 3349 (evening)

Online Systems & Software
Telecomputing
Oxford, London, Manchester, Amsterdam

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CONSULTANTS

HAVEN (COMPUTER SERVICES) Ltd. is the London headquarters of a well-established international Software House Network. To fulfil their planned growth requirements, applications are invited for the following posts:

2 ANALYSTS — 1 MAINFRAME, 1 MINI

£5,500 - £7,500

Both should have a minimum of 4 years' experience in D.P. with at least 1 year in Systems Analysis. In addition, the Mini Analyst should have 2 years' experience in designing systems for Minis.

The successful candidates will have worked on at least two of the following applications: Stock Control, Sales Ledger, Purchase Ledger, Nominal Ledger, Payroll and Invoicing. The Mini Analyst will also have some background in Real-time. He will find that experience of packages of the above applications an advantage.

On-Line/Database experience is preferred for the Mainframe Analyst.

Ref. 40/1

TRAINEE/JUNIOR PROGRAMMERS

£3,000-£4,500

Vacancies exist for keen, ambitious trainee/junior programmers. Applicants should be graduates in Computing Science, commercial school trained or TOPS students.

Alternatively, up to 1 year's programming experience, preferably in a commercial environment, is required.

Ref. 39/2

PROJECT LEADER

£6,000-£8,000

This post offers wide opportunities for a responsible and enthusiastic candidate with at least 5 years' D.P. experience in analysis and programming. Some project control/leadership experience, as well as a sound background in general commercial systems is essential.

Previous experience in a Software House environment would also be useful.

Ref. 40/3

MINI & IBM/ICL MAINFRAME PROGRAMMERS

£4,000-£6,500

Successful candidates will have at least 2 years' programming background in General Commercial Systems; Mini Programmers will have a minimum of 1 year's Mini experience.

The Mainframe Programmers will have a knowledge of COBOL. A second language, plus On-line/Database experience, will be an asset. The Mini Programmers will ideally have a knowledge of Basic or Fortran or COBOL, and some Real-time experience.

Ref. 40/4

These positions are permanent and candidates seeking long-term career advancement will find considerable scope and prospects within this progressive company. Flexible working hours and excellent fringe benefits are added attractions.

Interviews will be held in London throughout October and offers will be made to successful candidates within 1 week of interview.

Telephone 01-831 6065

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24 Gray's Inn Road
London WC1X 8HR
Telex [illegible] Haven G

occ computer personnel limited

Middle East

Analyst Programmers
c £14,000 tax free plus benefits

Analyst programmers are required for a new computer department being established at a leading motor distributor in Saudi Arabia, which is due to take delivery of an IBM 370/115 in March 1979. The systems will initially be a mixture of batch and on-line, running under CICS and DOS/VS and written in RPG II.

Benefits

- ★ Free furnished accommodation
- ★ Free company car
- ★ Free medical treatment

Environment

- ★ Leading motor distributor
- ★ New 370/115
- ★ New DP department

Requirements

- ★ Solid systems and programming experience
- ★ At least 18 months' practical experience of CICS, DOS/VS, RPG
- ★ Self motivation
- ★ November start

Successful candidates will ideally have at least 18 months' practical experience of CICS, DOS/VS and RPG. There will be a high degree of user involvement and the positions will suit self starters. Experience of the distributive side of the motor trade would be an added advantage.

These positions are on bachelor status, enjoying the following benefits: 30 days' leave and 15 days' public holidays per annum. Free furnished accommodation of good standard with free electricity and water. Free medical treatment and company car.

FINAL CLIENT INTERVIEWS IN LONDON OCTOBER 16-17

To discuss these positions further, please telephone Marian Tabone on 01-242 9356 (day) or 01-555 5568 (evenings and weekends)

Computing
Services
Association

16 Bedford Row
London WC1R 4EB
01-242 9356
Telex 21120

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computer appointments

COMPUTER MANAGER

Cambridge Newspapers Ltd, an established newspaper publishing group, is to install a Computer System to cater for a wide range of the Company's business, including advertisement booking, Text Setting, newspapers circulation and accounting, based on digital equipment.

PDP 11 Computers with software supplied by Press Computer Systems Ltd.

A vacancy exists for a computer manager to work with the suppliers to ensure a successful implementation and subsequently take over responsibility for the Computer System, reporting to the general manager.

Applicants for this key appointment must be aware of the special urgency of newspaper publishing and preferably should have experience of working with mini computers in a real time environment.

This important appointment will command a salary and other benefits that reflect the responsibilities.

Douglas L. Cooper
Managing Director
PRESS COMPUTER SYSTEM LTD
Albany House, Chapel Ash
Wolverhampton WO3 OUJ

Earn tax-free salaries in Saudi Arabia

The Life Sciences Group of the Whittaker Corporation is responsible for the staffing and management of three general hospitals in Saudi Arabia, where the task is to provide a high standard of Health Care in this rapidly developing country. We now wish to appoint the following people to be based in our Joddah Data Centre.

Programmer (c. £7000)

with three years' commercial programming experience, two of which will have been spent using RPG-11 on IBM equipment. A knowledge of DOS/VS POWER is desirable and successful applicants will have the opportunity to progress to systems design work.

Data Controller (c. £5000)

with a minimum of four years' data entry experience and at least a year in a similar capacity. Minimum speeds of 15,000 characters per hour and experience of IBM 3741/2 diskette machines is essential. Salaries are TAX FREE to U.K. residents and the benefits include free accommodation, life and medical insurance and return air fares. Additionally, there are bonuses of around £500 after 6 and 18 months and an extra month's salary on completion of the two-year contract.

Please phone 01-[illegible] 7885, or write with brief career details to

J. M. MacDonald
WHITTAKER LIFE SCIENCES LTD
[illegible] Knightsbridge, SW7

THE SALES BIT

From the technical to the emotional

THE decision-making process is never consistent in terms of either duration or the number of meetings involved. Its nature is often a function of the management style adopted by the company involved.

An autocratic organisation usually demands time for consideration and fewer decision stages than one which is bureaucratic or democratic by structure or philosophy.

However, the decision-making process has another type of characteristic which usually presents itself, no matter what the product, and irrespective of the duration of the selling cycle or the structure of the potential buying organisation.

Let us call it the Technical/Emotional Factor.

So many times I have heard salesmen bemoaning the fact that they have achieved the stage of best contender on the short list, only to lose the business to an apparently inferior competitive product. There are lots of excuses of course, but more often than not failure has been due to a lack of awareness of the technical and emotional aspects of decision-making.

The purchaser of any product has first to ask himself "Which products can do the job in the way we wish to do it at a price we can afford?" This produces the traditional short list.

Having reached this point the technical evaluation process is over, except perhaps for questions of degree and philosophy. Thus, the buyer feels sufficiently secure to give exposure to his own emotional needs.

This can involve ego, politics, sensuality, security, taste, affection, avarice, inertia, and so on, ie "I know all the products I have short-listed can do the job, so why not choose this one, because: the supplier treats me like a VIP; that will please the group MD; I fancy the salesman; the supplier is a large organisation which is unlikely to go out of business; it matches the wallpaper; the salesman is a really nice guy; a plain green van might just happen to make a special delivery to my home; it might not be the best, but it will need the least effort from me."

The reason why so many salesmen are able to "snatch defeat from the jaws of victory" is because they relax when they reach the point of price/performance superiority. They fail to appreciate that the selling process becomes much more difficult and demands the most thought and attention between the short list and final decision stages, primarily because the situation not only veers from the technical to the emotional, but also from the logical to the illogical.

During this stage; the need for situation evaluation is considerable. The salesman must anticipate the emotional influence upon the negotiation, not only from the standpoint of his own company and the prospective client, but also from that of his competitors, and set his strategy accordingly.

Many salesmen find it hard to accept that a company choosing a computer goes through basically the same stages and criteria of decision-making as someone buying, say, an electrical appliance in a retail store. But it's true.

This brings to mind one final point. Don't assume you have the business until the money is in the bank.

TRADER

BOOK REVIEW

Primer For Small Systems Management, by Grady M. Easley. 164 pp. £12.35. Prentice/Hall International.

ONCE again, the publishers seem to be unsure of their market objectives. This book deals in a highly practical manner with the responsibilities and skills required by a data processing manager. But somewhere along the publishing line, an attempt to involve the student was introduced and the format was changed to that of a textbook. As a result, basic review questions are introduced at the end of each section — an irritating interrupt for many readers.

For the UK buyer, the book is disturbingly IBM-biased.

Even making allowance for IBM being an American institution, the book oversteps normally accepted independence marks. IBM is freely dispensed. Page 126, for example, notes "your most familiar equipment supplier is your friendly IBM representative." Plug compatible manufacturers are dismissed with the thought that "purchasing non-IBM gear could be a false economy." The index proves the point. IBM features no fewer than 50 times. Burroughs, Honeywell, NCR and Univac score a total nil. Perhaps the next edition should be retitled An IBM Primer . . .

In all other respects the book does make a determined attempt to cover all aspects of managing small computer systems. The author is a noted authority, one incidentally who has received the Data Processing Management Association Individual Performance Award.

Apart from being required reading for IBM salesmen, the book will be of interest to company management faced with the implementation of their first (IBM) machine.

ALAN JOHN SIMPSON
Institute of Data
Processing Management

Puzzle answer

$49\text{[illegible]} + 50\frac{1}{2} = 100$

earn £15,000 p.a.+

Practical Systems International Limited are one of the leading computer personnel recruitment agencies in Europe.

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WEST MIDLANDS COUNTY COUNCIL

TRANSPORTATION AND ENGINEERING DEPARTMENT

SENIOR ENGINEER
(TRANSPORTATION)

£6060-£6702. To work in the Mass Public and Freight Transport team in the Transportation Division responsible for public transport input to the Transportation Policies and Programmes, Inner Cities Policies and Programmes, Development Plans, Road Scheme Design and County Structure Plan. The team investigates public transport problems and prepares and evaluates the preliminary designs of solutions plus the investigation of some major public transport infrastructure schemes. The work involves close liaison with many organisations including the Passenger Transport Executive and District Councils.

RELOCATION EXPENSES MAY BE AVAILABLE IN APPROPRIATE CASES.

For further details and application form write or telephone quoting post Ref. TE4120 to: The Personnel Officer, West Midlands County Council, 1 Lancaster Circus, Queensway, Birmingham B4 7DJ. Telephone: 021-300 7824. A telephone answering service operates out of office hours. Return applications by 20th October, 1978.

West Yorkshire Metropolitan County Council
Traffic Unit

SECTION ENGINEER POST
REF. TF75017
PO1A £5727-£6342 (inclusive of supplement)

To lead a small team undertaking the planning, design and implementation of various parts of the UTC signal network in the County, initially primarily in Bradford and such other traffic signal work as is necessary. The post is based in Leeds. Sound background in traffic engineering essential, particularly in the field of Control Systems and Traffic Signals, together with experience in Transyst. Professional qualifications in relevant discipline required.

OPERATOR/TECHNICIAN
POST REFS. TF34005/6/7
TS £3732-£4146 (inclusive of supplement) plus shift allowance

The Urban Traffic Control scheme involves the computer control of Traffic Signals in Leeds and Bradford, using closed circuit television facilities to monitor traffic. Control Centres in both cities will operate from 6-7 a.m. to 7 p.m. Monday to Saturday, acting also as fault reporting centres and manned by Operator Technicians on a shift basis.
Working from either Control Room duties will include first line maintenance procedures on the equipment installed at the Centres and on the street together with control desk operation.
Suitably qualified applicants will have a light current electrical engineering background or relevant operational traffic control experience. Driving licence required.

Application forms for the above posts may be obtained from the Directorate of Planning, Engineering and Transportation, Room 2/18, County Hall, Wakefield, and should be returned by 23rd October 1978.

Data Base Administrator
Salary £7329-£8073 p.a. inc. + car allowance

The Boroughs of Ealing and Brent are developing an on line Data Base to provide information on all aspects of property within the boroughs.

It is policy to exploit the large quantity of information on land and property already collected in order to improve management in all departments of both Authorities that deal with property matters.

The project is being developed as a major part of overall computing strategy.

The Data Base Administrator will be responsible for controlling the use of Data Base and managing new Data Base applications from inception through to implementation.

He or she will lead a small design and programming team and report at top management level. The team has data processing support. The central files of the Property Data Base are already operational on the joint installations IBM 370/145. The Data Base Project makes use of DL/1, GIS, CICS and on line development facilities.

The administrator will require the experience to direct a demanding project and the ability to communicate effectively at all levels. Local Authority experience will be an asset but is not essential; a degree or equivalent qualification is required.

The post is based at Ealing Town Hall.
35 hour flexible working week, staff restaurant, interest free loans for season tickets, superannuation scheme and assistance with re-location expenses in approved cases.

For an informal discussion please ring Mr R Wayne, Computer Manager 01-992 5566 Ext 2291.

For further details and application form from Personnel Office, Room A202, Ealing Town Hall, Ealing W5 2BY. Tel. 01-579 2424 Ext. 3350.

Closing date 16th October (interview for short listed applicants are provisionally arranged for 26th October). Please quote ref 151TC.

Ealing
London Borough

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1. Experienced Programmer?
2. Real Time experience?
3. High level languages (RTL2 or Coral 66)?
4. Assembler or Macro 11?
5. Mini experience (particularly PDP 11)?
6. Op System knowledge (particularly RSX)?
7. Peripheral experience (e.g. Micros)?
8. Telecomms experience (particularly switching/X25)?
9. Formal Software testing?

If you can answer yes to at least 6 of the above questions then answer question 10.

10. Can you afford to turn down a package of £20,000 with many other benefits?

If your answer is no then contact

Overseas Recruitment Consultant
HOWARD ORGANISATION INTERNATIONAL LTD.
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8 Elstree Way, Borehamwood, Herts.
01-953 4066

Metropolitan Borough of Wigan
WIGAN COLLEGE OF TECHNOLOGY

Applications are invited for the following post in this recently designated Tertiary College.

LECTURER GRADE II IN COMPUTING

Applications are invited for this post to take effect from 1 January, 1979.

Candidates should have experience of PDP8 machines and must be prepared to accept the organising responsibility for certain courses and computer services as well as provide lectures on Computer Science and Data Processing.

Industrial experience and the ability to contribute lectures in Operational Research will be an advantage.

Salary: Lecturer Grade II is the range of £4,101-£5,655.

Further particulars and application forms from the Chief Administrative Officer, Wigan College of Technology, Parson's Walk, Wigan WN1 1RR to be returned within 14 days of this advertisement.

HALTON BOROUGH COUNCIL
Chief Finance Officer's Dept.
Computer Section
Post No. 84

Snr. Analyst Programmer
Grade AP5/SO1 — £4,481 p.a. – £5,256 p.a. + £312 p.a.

This post offers a challenging and rewarding opportunity to participate in the development of a new ICL 2904 installation due to be commissioned in the next month. Applicants should have several years' Systems experience using Discs and/or tapes and a programming background that includes COBOL. The positions will involve taking charge of systems from investigation to implementation and negotiating with user department.
This post, based Widnes, and a system of flexible hours is in operation. The council will be willing to pay reasonable removal expenses and make available in appropriate cases accommodation to the successful candidate.
Applications in writing, giving details of age, qualifications, experience, together with the names and addresses of two referees should be forwarded to: The head of Personnel & Management Services.

HALTON BOROUGH COUNCIL
MUNICIPAL BUILDING
KINGSWAY, WIDNES,
CHESHIRE WA8 7QS
Closing date 19th October, 1978.

Municipal Building,
Kingsway,
Widnes, Cheshire

R. Turton
Chief Executive

KBS Computer Services
RECRUITMENT DIVISION,
State Insurance Building, 14 Dale Street,
Liverpool L2 4TH. TEL: 051-236 7711

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SYSTEMS ANALYSTS TO £7,500 SURREY REF: LL 78117	Our client is offering top salaries to attract really high calibre systems analysts. An IBM 370 under DOS/VS is in use. You should have between 4 and 5 years systems experience. Challenging schedule of projects awaits. Holidays and benefits are excellent.
COMPUTER OPERATORS £4,500 – £5,800 BERKSHIRE REF: LL 78112	Blue chip company operating twin IBM 370 installation under DOS/VS. You need two or more years experience. They offer an impressive time sharing and TP environment. Non-contributory pension scheme, free life assurance, four weeks holiday.
SENIOR ANALYSTS & PROGRAMMERS £5,000 – £5,500 MERSEYSIDE REF: LL 78111	Over three years systems or programming background could gain you senior status in client's IBM 370 installation. Main language COBOL, mixture of batch and on-line database work. Plans in hand for distributed processing. Flexitime scheme. Holidays 4+ weeks. Relocation assistance available.
SENIOR PROGRAMMERS £4,000 – £5,000 LIVERPOOL REF: LL 78107	Programmers with a minimum three years COBOL and BAL experience could make real seniority with client operating IBM 370 under DOS. Imaginative assignments scheduled. Relocation assistance available.
SENIOR SALES PERSON HIGH INCOME + CAR NORTH WEST REF: BVK2	Our client has a vacancy for a high calibre sales person with a provable track record. The market is computer services. Targets are high. Rewards are outstanding. Opportunities are unlimited.

Ring 051-236 7711 (24 hours)

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The successful applicant will handle the whole computer function of the firm and work to a tight time schedule.
Existing programs have to be refined and developed and new ones written to meet our requirements.
Salary in the range of £4,000 to £4,500 for a person of the right abilities and experience which must include commercial experience.
Applications in writing with personal and career details to K MacLeod

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Tel: 01-686 — 2622

City Treasurers Department
PROGRAMMERS
Salary scale up to £5,073

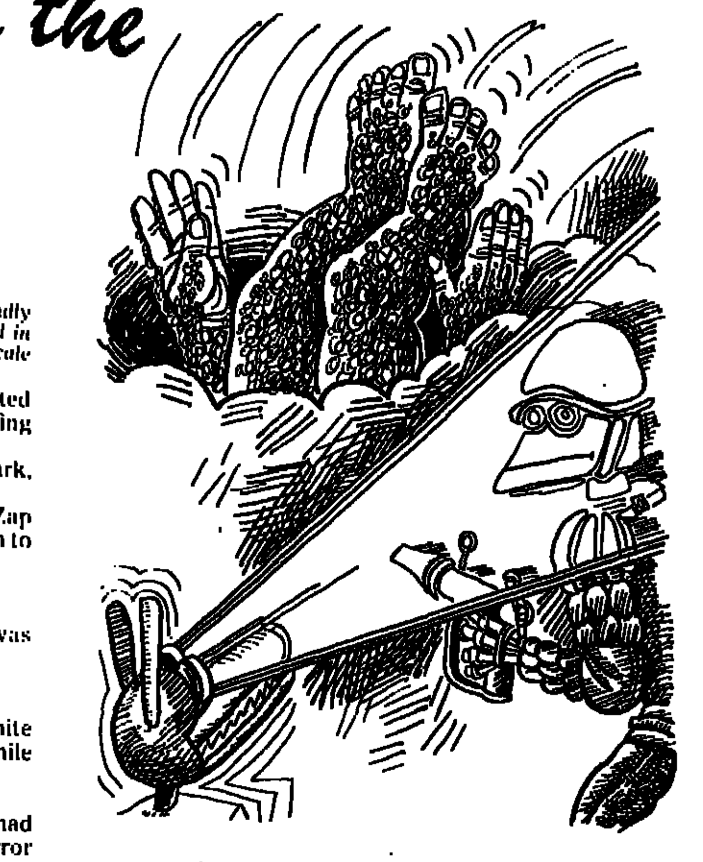
The City Council have an IBM 370/138 on order and are planning a considerable expansion of both financial and non-financial services for departments. The new applications will be on-line (CICS/VS) and will use a database management system (DL/1).
Here is an opportunity to join established project teams to design and implement these applications using the latest techniques.

If your experience is limited we will train you. If your experience is other than IBM we will provide conversion training.
The newly constructed Civic Offices include a staff restaurant. Flexible working hours. Removal and resettlement expenses up to £500 payable in appropriate cases.
Application forms are available from the City Treasurer, Civic Offices, Guildhall Square, Portsmouth PO1 2AR, or telephone Cath O'Neill on (0705) 834348.
Closing Date 20th October, 1978.

city of PORTSMOUTH

Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth



Block 17 (Obloquy)

We left Hex in mid-air, being borne up a cliff side by the friendly apeman who speaks colloquial Esperanto. The volcanic bowl in which they have been sheltering is warming up for a full-scale eruption, and the System's forces are hard on their heels

WHEN Hex regained consciousness he was being deposited on a mat of grass. He looked up and saw Piltdown preparing to descend once more to fetch Ascii.

Half a minute later the four evacuees heard a single bark, then silence. They waited.

"He took six minutes and ten seconds with you," Zap informed Hex, "but he's more tired now so I'd expect him to take about eight for the dog."

"How long has he been gone?" Hex questioned him.

"Ten minutes now."

Hex crept to the ledge and peered over. There was nothing to see.

"Perhaps he's taking a well-earned rest," said Cleo.

Hex was afraid that the bionic beasts had quarrelled.

The geyser spurted again. They could just see the white foam at its crown, level with their vantage point. While they watched, a curt command startled them.

"Stay right where you are!"

It was an ambush by the two animal handlers who had tracked Piltdown and reported their presence to Error Squad HQ. Tiring of their vigilance at the tunnel entrance and attracted by the sound made by the escapers, as well as by Ascii's lights, they had picked their way round the peak and taken this opportunity to steal up unobserved. Hex now found himself with his back to a hundred metre drop looking down the barrel of a recoilless impact device. The second robot, an UltiMate, touted a hypodermic stun-gun — evidently brought to tranquillise Piltdown with a chemical dart when they caught up with him.

There was little they could do except raise their arms in surrender; but they did not have long to wait before the scraping of Piltdown bearing Ascii up the cliff became audible. The robot with the stun-gun crouched down and took aim.

But it was the metallic Ascii who came over the edge first into his sights.

There was a discordant "thwang" as a dart ricochetted harmlessly off his steel hide. While the robot hastened to re-load, Piltdown hoisted himself over the side.

Everything happened at once. Piltdown was no bovine quarry but a fully sentient being. He knew the threat they posed to his life and liberty. With a bellow like an elephant on heat he bore down on the luckless UltiMate, whose auto-feed mechanism had jammed, picked him up by the antennae and hurled him bodily into the void. The howl of terror as he fell to his doom imprinted itself permanently on their memories.

But the other robot was not so slow. Dodging a hard diskette flung at him frisbee-style by Zap, he let loose a volley of fire that caught the noble savage head on. It was the end. The heroic creature's legs buckled. As he was falling another hail of shots ploughed into his body. He swayed, teetered for a long moment on the brink, and toppled — almost gracefully — into the pit.

Ascii's revenge was swift and decisive. No sooner had the lethal bullets left his gun than the murderous robot was lit up like an incandescent bulb by the full power of Ascii's lasers. The hound, enraged at seeing his blood cousin scythed down, did far more than was necessary to toast the robot's circuitry to a frazzle. He would have drained his batteries and left Piltdown's killer a melted lump of iron had not Hex intervened to stop him.

The dust settled; but nobody spoke. Then into the silence Hex injected the most inept remark of his career.

"The box!", he cried. "We've lost the M5!" He began scrabbling around the corpse of the fried robot, who had carried a rope slung over his shoulders for lassoing Piltdown, but it was too scorched to use.

The others didn't know whether to laugh or cry.

"We've just lost someone who gave his life in saving ours, and all you can think of is your goddamned black box!" expostulated Cleo, outraged by his callous insensitivity.

The rebuke hardly penetrated. "It was our only hope of defeating the System."

"Only hope? The bloody thing didn't even work. If Piltdown and I hadn't logged you off you'd still be down there sitting like a dead zombie, waiting for the mountain to blow its top."

"Of course it worked," was Hex's denial. "You just butted in at the wrong moment. You didn't even know how to log us out properly."

"Perhaps I might have known if you hadn't forgotten the golden rule: no implementation without documentation."

"It was pretty obvious. Just type STOP, END; FINISH. ENDJOB."

"Oh yes, obvious! STOP END FINISH ENDJOB," shouted Cleo, rising to a new pitch of indignation.

"You still got it wrong," goaded Hex, now angry in his turn. "It's space STOP comma END semicolon FINISH fullstop carriage-return linefeed dollar ENDJOB end-of-text."

"Oh I see," replied Cleo with heavy sarcasm. "It's all self-evident really. You might almost call it self-documenting. Truly a monument to the system designer's art. That judiciously placed semicolon. Such exquisite elegance. Its aesthetic implications are breathtaking. And the full stop. What a master stroke! Words fail to do it justice. So simple in concept, so conclusive in execution. Pure poetry in JCL."

"You're just ignorant," he stormed. "The M5 represented a radically new departure. It deployed a matrix of holonic processors with bisociative memory. There has never been anything like it. It would have opened a whole new era."

"And you're just obsessed with gadgets. You're still a systematist at heart. You don't care about people. You're only a half-man," was her scornful denunciation.

"I'm not half a man. I'm a whole android."

"Well, whose side are you on?"

"Yours," he yelled, surprising himself by his own vehemence.

Cleo burst into tears.

"Come on you two," cajoled Zap. "You're not married yet."

Aren't women strange? Are they?

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Programmer

Hertfordshire **to £5,000p.a.**

The Company — Merck Sharp & Dohme Limited is part of an international organisation engaged in the production and marketing of ethical pharmaceuticals. MSD U.K. is the largest supplier of prescription medicines to the National Health Service. It operates from 4 main locations: its headquarters in Hoddesdon, Hertfordshire, plants at Ponders End, Middlesex and Cramlington, Northumberland and an animal research centre at Goose Green, Hertfordshire.

The Job — Reporting to our Systems Manager the incumbent will be a member of the development team and will work in close conjunction with Systems Analysts through to project completion. Basically it is a programming job but some systems analysis is involved. Ample opportunity for job satisfaction and personal development. Existing application areas include order processing, materials management, accounts receivable/payable, costing, budgetary control and sales and market planning analysis. Applications currently being developed are primarily in the marketing and finance areas.

The Person — Aged 22-30 with a sound RPG background preferably on IBM equipment. Knowledge of COBOL and/or TP techniques would be of special value.

Compensation — An attractive salary to £5,000 plus good fringe benefits consistent with an international organisation of high standing and reputation. Generous re-location package where appropriate.

For further information and an application form contact Mrs Sally Bird in our Personnel Department.

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Computer Services Division

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In each case the starting salary will be dependent upon experience and qualifications. Working conditions in the newly constructed office accommodation are excellent and include a staff restaurant, a system of flexible working hours is also in operation and aids to relocation expenses are available in appropriate cases.

For an application form (returnable by 16th October, 1978) and further details please write to the director of personnel and management careers.

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Application forms are obtainable from the Personnel and Recruitment Officer, Directorate of Management Services, London Borough of Lambeth, 17 Porden Road, London, SW2. Tel: 01-274 7722, Ext 696. Please quote Ref: M7 when applying.

LAMBETH